THE

HISTORY

OF THE

WORKS of the LEARNED:

GIVING

A general VIEW of the STATE of LEARNING throughout *EUROPE*, and containing an impartial Account and accurate Abſtracts of the moſt valuable Books publiſhed in *Great-Britain* and Foreign Parts.

INTERSPERS'D WITH

DISSERTATIONS on ſeveral curious and entertaining Subjects, critical Reflections, and Memoirs of the moſt eminent Writers in all Branches of polite Literature.

For MAY, 1743.

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Of whom may be had,

The *Hiſtory of the* WORKS *of the* LEARNED, for the Years 1738, 1739, 1740, 1741, and 1742.

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WHereas there were ſeveral material *Errata* in Pages 49, 50, 51, 52, of *The Works of the Learned*, for *January* laſt paſt; thoſe Pages are now reprinted, and thoſe who have already purchaſed that Month may have them, upon ſending for them to *Jacob Robinſon*, the Publiſher of this Work.

N. B. The cancelled Leaves are reprinted on a ſmaller Letter than the others; by which Mark Gentlemen may know, hereafter, whether thoſe Pages in their Books have been rectified or not.

THE HISTORY OF THE *WORKS of the LEARNED.*

For MAY, 1743.

ARTICLE XXII. *continued.*

AND as theſe Writers agree with *Moſes* in their Account of the Tranſactions of *Abraham*'s Life, ſo alſo it is remarkable, that they give much the ſame Character of him; all of them allowing him to be eminent for his Virtue and Religion: And they add moreover, that he was a Perſon of extraordinary Learning and Wiſdom. *

Jacob's Pillar of Stone, *Gen.* xxviii. 18. was known among the Heathens; as is evident from an idolatrous Practice which prevail'd among them, and which very much reſembled *Jacob*'s Tranſaction. There is a remarkable Paſſage in *Sanchoniathon*, Part of which *Philo Byblius* tranſlates by two *Greek* Words ſignifying *animated Stones*. *Bochart* thinks the original Words were ſuch as ſhould have been rendered *anointed Stones*; the Cuſtom of anointing, conſecrating, and worſhipping Stones, being frequent amongſt the *Phœnicians*. Theſe Stones, thus conſecrated, they called *Bætylia*, which they undoubtedly borrowed from *Jacob*'s *Bethel*. *Photius*, from *Damaſcius*, obſerves, that there were ſeveral of theſe Stones upon Mount *Libanus*, which were called *Bætylia*, and of which many wonderful Things were related; and

* *Shuckford*'s *Connection*, Book IV. Pages 33, 35, &c.

that they were conſecrated to the Gods, to *Saturn*, *Jupiter*, *Sol*, and others.

The Story of *Apollo*'s Baniſhment, and his ſerving *Admetus* in the Capacity of a Shepherd, may have been derived from ſome Tradition, which the Heathens had of *Jacob*'s ſojourning in *Padan-Aram*, and ſerving *Laban* ſo long a Time for his Daughter *Rachel*: For from *Callimachus* we learn, that Love was the Cauſe of *Apollo*'s Travels; and that the Cattle under his Care grew and encreaſed in a ſurpriſing Manner.

The ancient Pagans were not unacquainted with the Hiſtory of *Joſeph*'s Life, his Afflictions, his Grandeur and Proſperity in *Egypt*, with all the main preparatory and concomitant Circumſtances.

The laſt hiſtorical Fact Mr. *Boſwell* mentions, as known to the ancient Heathens, is the Departure of the *Iſraelites* out of *Egypt*. This Event is taken Notice of by ſeveral of their Writers, particularly *Manetho*, *Chæremon*, and *Lyſimachus*; and tho' their Accounts are blended with numerous Falſhoods, Miſtakes, and Inconſiſtencies, yet ſtill ſome ſmall Remains of Truth are obſervable amidſt their moſt monſtrous Fables and Fictions. From their Teſtimonies it is clear, that the *Iſraelites* were conducted out of *Egypt* by a Perſon whoſe Name was *Moſes*; and that, after ſome Hardſhips and Difficulties, they ſettled in *Judea*, and built the City of *Jeruſalem*.

The Teſtimony of *Artapanus*, preſerved in *Euſebius*, is ſtill more full to the Purpoſe. "It is re-
"ported by the *Heliopolitans* (ſays this Ancient)
"that the Leader of the *Jews* went out of *Egypt*
"with a great Body of Forces, and Cattle proper
"for Sacrifices; that they ſpoiled the *Egyptians* of
"their Goods; that a Voice from Heaven directed
"*Moſes* to ſtrike the Sea with his Rod; that here-
"upon the Waters parted, and the *Iſraelites* walked

"on

" on dry Ground; that the *Egyptians* in a Body " followed them; that there was a Light which " attended the *Jews*, who went before them; and " that the Sea again returned, and closed up the " Passage; and that the *Egyptians* were all de- " stroyed by Lightning, and the Return of the " Waters."

Mr. *Boswell* next proceeds to lay before his Reader the Accounts which we have of some of the Heathen Gods; and points out the Resemblance which these Accounts bear to the History of the *Patriarchs* in the *Old Testament*.

1. Then, *Saturn* was expressly called Ἀδανὸς, which is no other than *Adam*, the *Greeks* having no Words ending in *m*; and whereas *Moses* tells us, that *Adam was formed out of the Dust of the Earth*, it is said, that this *Adanus* was the Son of Heaven and Earth. Moreover, under the Reign of *Saturn* the State of Things is represented in a Manner perfectly consistent with the Condition of our first Parents in Paradise. Farther, *Adam* hid himself from the Presence of God, and was cast out of Paradise; *Saturn* is said to have been expelled his Dominions, and to have derived his Name from the *Hebrew* Word which signifies *to hide*; and accordingly had the Title of *Deus Latius*.

Several Particulars likewise in the Characters of *Noah* and *Saturn* are found to have a surprising Resemblance; our Author cites them from *Bochart*. Some of them are, " This *Pagan Deity* is declared " to have been a Planter of Vines; to have been " the great President of Drunkenness; to have " been the Enacter of a Law, which prohibited " Mankind from looking at the Gods naked; to " have foretold *Deucalion*'s Flood; and, in conse- " quence of the Prediction, to have built an Ark; " to have taken into it all Kinds of Birds and

" Beaſts, and, upon the Decreaſe of the Water, to " have ſent ſome Birds out of it, to try if any dry " Land appeared, *&c.*"

The Gods next eſteemed by the Heathens were *Jupiter*, *Neptune*, and *Pluto*, who were no other than the Sons of *Noah*; their principal Names and Characters exactly anſwering to the Names and Characters of *Shem*, *Ham*, and *Japhet*.

That *Jupiter* was no other than *Cham*, or *Ham*, is thus proved. *Herodotus* tells us expreſly, that the *Egyptians* called him *Ammon*, that is, *Ham*; and *Egypt* was called the *Land of Ham*, Pſalm cv. 23. and *Africa*, for the ſame Reaſon, *Hammonia*. Add to this, that *Ham* is ſaid to have been undutiful to his Father, and, by his Behaviour, to have derived a Curſe upon his Poſterity; and, agreeably to this, we are told, that *Jupiter* rebelled againſt *Saturn*. *Ham* is ſaid particularly to have uncovered the Nakedneſs of *Noah*. The fabulous *Jews* ſay, that *Ham* cut off his Father's *Genitalia*: The Heathens pretend that *Jupiter* did the ſame by *Saturn*.

Some will have it, that Ζεὺς, the ancient Name of *Jupiter*, was derived from ζέσις, which ſignifies *Heat*, and anſwers exactly to the *Hebrew* Word *Cham*, which has for its Root *Chamam*, to *wax hot*. But, however this be, Mr. *Boſwell* thinks it highly probable, that *Jupiter* was made out of the Words *Ja*, or *Jen-Pater*, *i. e.* the Father *Jah* or *Jen*; a Name peculiar to the Creator. *Jovis*, *Jovi*, and *Jove*, are manifeſtly the ſame as *Jova*, or *Jehovah*. The Title *Jupiter Sabaſius* was evidently made out of the *Hebrew* Words *Jehovah Sabaoth*, the *Lord of Hoſts*.

Neptune likewiſe was manifeſtly *Japhet*. The Name and Epithets that are given to him being perfectly ſuitable to what we read of *Japhet* in *Holy Writ*. It is ſaid, *Gen.* ix. 27. *God ſhall enlarge Japhet*; and agreeably to this, the Heathen Deity was

was called *Neptune*, from the *Hebrew* Word *Niphta*, which comes from *Patha*, which ſignifies to *enlarge*.

By the Poſterity of *Japhet*, we read that *the Iſles of the Gentiles were divided*; by which are undoubtedly meant the Iſlands in the *Mediterranean*, the Family of *Japhet* making their firſt Settlements in this part of the World. Now, as the Heathens believed *Neptune* to be a God, it was not at all ſtrange (conſidering the Iſlands where *Japhet* and his Poſterity firſt ſettled) that they ſhould make him the *God of the Sea*.

The Parallel betwen *Pluto* and *Shem*, our Author owns, is not ſo clear. However, it ſeems, there is good Reaſon to believe, that they were the ſame: *Sanchoniatho* tells us, *Pluto* was one of the Sons of *Saturn*, who, as hath been ſhewn already, was *Noah*.

Mr. *Boſwell* in the next place invites his Readers to attend to a few obvious Circumſtances, where the Reſemblance between ſeveral religious *Inſtitutions* and *Ceremonies*, obſerved by the *Jews* and *Heathens*, is manifeſt beyond Exception.

That the *Seventh Day* was deemed ſacred by the whole *Heathen* as well as *Jewiſh* World, he has prov'd in Pages 227, 228, of this Volume; he has alſo fully treated of the manner in which the *Heathens* applyed to and received the Reſponſes of their *Oracles*, and compared it with the Account we have of the *Urim* and *Thummim* mentioned in Holy Writ, in Page 259, *&c.* The Article he now inſiſts on is that of Sacrifices.

As to the ancient *Sacrifices*, he ſays, whether we conſider the *Nature* of them, the *different Sorts* of Creatures that were ſacrificed, the *Qualities* of thoſe Creatures, the principal *Rites* and *Ceremonies* that attended Sacrifices, or the *Prieſts* by whom they were offered up, the ſimilitude of Uſages in theſe ſe-

veral Reſpects amongſt the *Jews* and *Heathens* is particularly remarkable.

The *Jews* had their *expiatory*, their *precatory*, their *federal* Sacrifices, and likewiſe their *Oblations* or Thankſgiving Offerings. In their expiatory Sacrifices they uſed two *Goats*, one of which was the *Scape Goat*, that was ſent into the Wilderneſs with the Sins of the People upon him, *Levit.* xvi. and accordingly the *Egyptians* had their *expiatory Sacrifices*, which conſiſted of *Goats*. They had a Song which they call'd *Tragedy*, from two Greek Words ſignifying *a Song at the Goat Sacrifice*. In imitation likewiſe of the *Jewiſh Scape Goat*, the *Greeks* had their *Animal vagum*. The *Jews* had a Sacrifice of a *Red Heifer*, the *Egyptians* in like manner ſacrificed a *Red Heifer*, taking care that not one Hair of it was black or white. In ſhort, our Author has ſhewn that all the ſeveral Sorts of Sacrifices amongſt the *Jews* were mimicked by the *Pagans*, as were the Rites obſerved in the offering of them.

The very *Names*, the *Orders*, the *Veſtments*, and *Qualifications* of the *Jewiſh* and *Heathen* Prieſts, reſembled each other in the minuteſt Particulars. The Hebrew Word for Prieſt is *Coen*; and a Prieſt amongſt the *Samothracian Cabiri* was called *Coes*, and by the old Gauls *Coenæ*. Another Name given to the *Heathen* Prieſts was *Patera*, which, according to *Bochart*, was made from the *Hebrew* Word ſignifying to *interpret*.

Amongſt both the *Jews* and *Romans* there was a *High-Prieſt* and Prieſts of an inferior Order; their *Habit*, or *Veſtments*, were likewiſe the ſame, *viz.* a *Mitre* and a *White Garment*; and they themſelves were required to be *perfect*, without *Blemiſh* or *Bodily Defect*. The Regulations in the *Moſaical* and in the *Greek* Writers to this Purpoſe, have a ſurpriſing Reſemblance. *Pythagoras* held, that the Prieſts

Prieſts ought to celebrate the Praiſes of the Gods, and perform all acts of Worſhip in *white Garments*. He that is admitted into the Order of the Prieſthood, ſays *Plato*, muſt be *without Blemiſh* and *Legitimate*.

Mr. *Boſwell* makes ſome Obſervations on the foregoing Particulars.

Firſt, then, he ſays, amongſt the many *Pagan* Cuſtoms and Inſtitutions that have been now mentioned, it is remarkable, that ſome of them (eſpecially their *Sacrifices*, their *Oracles*, and their *Obſervation of the Seventh Day*) are of ſuch a Nature, that nothing but a *Revelation* could poſſibly have made the Practice of them univerſal.

Secondly, it further appears, that the Reſemblance between the *Sacred* and *Profane* Stories, Cuſtoms, Inſtitutions, *&c.* (when the latter are ſtript of their mythological Diſguiſe) is too manifeſt to be denied.

Theſe two Propoſitions being evident, it undeniably follows, either,

1. That *Moſes* borrowed his Accounts of Things from the *Heathens*; or,

2. That the *Heathens* borrowed their Accounts from the Hiſtory of *Moſes*; or,

3. That both *Moſes* and the *Heathens* borrowed their Accounts of Things from ſome Revelation, which was made to Mankind in the early Ages of the World.

If the firſt be true, then the *Heathens* muſt have had proper Hiſtories and Records for that Purpoſe. But none ſuch are known. *Sanchoniatho*, *Manetho*, and *Beroſus*, ſome of the moſt ancient Heathen Hiſtorians were all poſterior to *Moſes*; and the Writers of the *Grecian* Hiſtory are ſtill later than thoſe. This is clearly proved by Biſhop *Stillingfleet* in the firſt Chapters of his *Origines Sacræ*.

But an Objector may ſay, that if Moſes *did not borrow his Accounts of Things from the Hiſtorians abovementioned, yet he might have made uſe of the ſame ancient Records.* This could by no Means be the Caſe, unleſs we can ſuppoſe the greateſt Abſurdity imaginable, *viz.* "that a regular well "written Hiſtory, carrying with it all the Marks "of Truth and Credibility, owed its Original to "Fable and Fiction, to idle Tales, to hieroglyphic "Nonſenſe and Inconſiſtency. The Books of *Moſes* "are written with a noble Simplicity, and have "all the Characters of a true and faithful Hiſtory "that ancient Records can poſſibly have. The "Capacity and Integrity of the Author, the Nature "and Circumſtances of the Hiſtory, the Harmony "of all its Parts, the eaſy, the impartial and "beautiful manner in which it is written; all theſe "Particulars concur to eſtabliſh its Credit, and "give it a Superiority over the moſt celebrated "Productions of Pagan Writers."

Mr. *Boſwell* proceeds further, on the uſual Topics, that is, to ſhew the Opportunities *Moſes* had of knowing the Truth of what he related; the Integrity of his Character as an Hiſtorian; and the Impoſſibility of his impoſing upon thoſe to whom he wrote, had he been ever ſo much inclined to it.

Now, ſays he, could the Author of ſuch a *Noble* and *well-digeſted Hiſtory* as we have ſhewn that of *Moſes* is, derive any Aſſiſtance from the *idle*, the *fabulous*, and *abſurd* Acounts of the Heathens? and where were ever any Heathen Records to be met with, free from Confuſion, Fable, or Abſurdity?

"The moſt ſacred Truths, it is allowed, may "be altered, diſguiſed, and degenerate into Fable. "This may eaſily happen through a long Courſe "of Time, for want of their being committed to "Writing, through the Extravagancies of a poetical "Fancy, and from many other obvious Cauſes: But

"that

" that *Truth* ſhould be derived from *Fable*, that a " regular and clear Courſe of credible Facts ſhould " flow from ſuch a polluted Fountain, is ſcarce " poſſible to be conceived. The *ſacred Records* " are found to be entirely conſiſtent with the Nature " and Reaſon of Things, with the Cuſtoms and " Manners of the Age in which they were written. " Is it conceivable then, that theſe Records could " owe their Original to, or be made up of ſuch " wretched Materials as *Fable*, *Falſhood*, and *Im-* " *probability?*"

Obj. 2. But if *Moſes* did not borrow his Hiſtorical Accounts of Things from the Heathen Records, muſt not the Jews and Heathens have had ſome ancient Records in common?

Our Author anſwers, it may be ſuppoſed they had; and that they derived ſuch Inſtitutions as were common to both, from the ſame common Source, from the Revelation made to Mankind in the firſt Ages.

Obj. 3. But, ſince *Moſes* reſided ſo long in *Egypt*, and there appears to have been a great Similitude of Uſages obſerved by the *Jews* and *Heathens*, is it not reaſonable to ſuppoſe, that *Moſes* borrowed ſome of his Inſtitutions from the *Egyptians?*

Our Author replies, is it likely that *Moſes* could copy after the Heathens, when one great and principal Intention of the *moſaical Inſtitution* was to caution and ſecure the *Iſraelites* againſt the Pagan Idolatry and Superſtition? Moſes recommends nothing more earneſtly to the *Hebrews*, than the avoiding the Cuſtoms and Converſation of the neighbouring Nations. Moſt of his Laws are particular Prohibitions of ſeveral Practices in uſe amongſt them. He ſeverely forbids a Cuſtom at that time univerſal, and in itſelf perfectly innocent, merely becauſe it was practiſed amongſt the Heathens, *viz.* the worſhipping the true God upon high

high Places; intending, by this Caution, to put a Stop to all idolatrous Worſhip, to all kinds of Superſtition, but particularly to thoſe licentious Feaſts, which had been introduced, and every where multiplied upon the Occaſion. * Now, is it conceivable after all this, that he would borrow any religious Uſages from the Heathens, from a People whoſe Religion, whoſe Cuſtoms and Inſtitutions he endeavoured to make the *Iſraelites* abhor?

Some have pretended, as *Spencer* and *Marſham*, that the *Iſraelites* borrowed Circumciſion of the *Egyptians*; but our Author has oppoſed to this Fancy ſome Paſſages of Mr. *Shuckford*'s *Connection*, which are ſufficient to overthrow it.

Now, if *Moſes* could not poſſibly borrow his Accounts of Things from the *Heathens*, it undeniably follows, that the *Heathens* muſt either have borrowed the few Truths which remain in their Writings from the *Hiſtory* of *Moſes*, or elſe that both *Moſes* and the *Heathens* derived their Accounts from ſome Tradition they had of a previous

* On this Principle, if I miſtake not, did our Diſſenters reject ſomeCeremonies ye tretained by the eſtabliſhed Church, *viz.* becauſe they had been introduced, and practiſed with great abuſe by the Romaniſts. They thought it wrong to ſymbolize with, and judged it right to have nothing in their Worſhip that might in the leaſt tend to reconcile them to that ſuperſtitious People. But when they did this, methinks it had not been amiſs, if they had ſubſtituted ſome other decent Rites, in the Place of thoſe they caſt out, which would have only been following the Example of the moſaic Inſtitution; and not have ſtripped their religious Service ſo naked as they have done. Or, if all external Ornament were diſagreeable to them, they ſhould have been very careful that their Syſtem excell'd in juſtneſs of Proportion and Neatneſs. Whether their long continued Prayer before Sermon, their long Sermon after that, their allowing no Place for reading the Scripture, except in a very few of their Congregations, be agreeable to the former I much doubt; and, certainly, with regard to the latter, the Worſhip of God is no where celebrated with leſs Decorum than in many of their worſhipping Aſſemblies. There are, it is true, ſome Exceptions.

Revelation.

Revelation. The Infidel is at Liberty, Mr. *Boſwell* ſays, to take which ſide of the Queſtion he pleaſes: Upon either Suppoſition, the Authority of the *moſaical* Hiſtory is eſtabliſhed beyond diſpute.

" For, if the *Heathens* borrowed their Accounts " of Things from the Hiſtory of *Moſes*, the Diſpute " is at an End. Their Concurrence with Moſes in " the many material Inſtances that have been here " taken Notice of, and in the Practice of ſuch " religious Inſtitutions as were manifeſtly the Re- " ſult of a Revelation, is a clear Proof, not only " that the *Hiſtory* of *Moſes* is a true and faithful " Account of the beginning of Things, but an " Account of Things revealed by God to Man- " kind.

" But, if *Moſes* and the *Heathens* derived their " Accounts from ſome Tradition they had of a " Revelation in the early Ages of the World, the " Concluſion in favour of the *Moſaical* Hiſtory " muſt be ſtill the ſame; it neceſſarily follows, " that the Hiſtory of *Moſes* contains the revealed " Will of God. Q. E. D.

Obj. 4. Upon Suppoſition the *ſacred* and *prophane* Accounts of Things were derived from one and the ſame Tradition, which *Moſes* and the *Heathens* had of a previous Revelation, does not this imply, *that the Religion of the old Pagans had ſome Pretenſions to a Divine Original?* And if ſo, how ſhall we diſtinguiſh which is the pure Revelation, *that* contained in the *Moſaical Hiſtory*, or *that* in the *Heathen Writings?*

This Difficulty, Mr. *Boſwell* ſays, hath been clearly obviated in the foregoing Pages; and therefore he here only obſerves, " The *Jews* and *Hea-* " *thens* muſt have derived ſome religious Inſtitu- " tions from *one and the ſame Tradition*, which " both People muſt have had of a previous Reve- " lation: The Reſemblance between the Uſages

" obſerved

" obſerved by *both*, is a clear Proof of this. As " far, therefore, as the Accounts of the Heathens " reſemble thoſe of *Moſes*, ſo far they may be al- " lowed to have ſome Claim to a Divine Original. " But is this a Reaſon for concluding that the Ac- " counts of the Heathens are the pure Revelation " of Heaven, or heſitating a Moment to pronounce " which is ſo, the *Jewiſh Religion or the Pagan?* " —— The Accounts which the Heathen Writers " have given of their Gods are monſtrous, and ab- " ſolutely irreconcileable with any Notions we can " poſſibly form of the Divine Nature. They are " ſaid to have been guilty of ſuch Acts of Cruelty " and Barbarity, as are ſhocking to common Hu- " manity. —— In ſhort, almoſt all the ancient Ac- " counts of Things, given us by the Heathens, are " a Mixture of confuſed Fable and profane Abſur- " dity.

" Whereas in the Hiſtory of *Moſes* we meet " with no improper Notions of the Almighty, nor " any impious Sentiments with regard to his pro- " vidential Diſpenſations; but the great Creator is " repreſented under Characters ſuitable to his Ma- " jeſty, and the Worſhip that is paid him is by no " Means unworthy the Divine Appointment. The " *Moſaic* Inſtitutions are evidently calculated for the " Honour of God, and the Good of Mankind; " and his whole Hiſtory has all the Marks of " Truth, and an inſpired Character.—The Hiſtory " of *Moſes*, then, is *the only true Account* of the " Beginning of Things, *the only pure Revelation* " that Mankind enjoyed before the Publication of " the Goſpel.

ARTI-

ARTICLE XXIII.

A Continuation of Dr. Long's *Aſtronomy.*

NOTICE has been taken of the firſt Book of this Work in our Hiſtory of laſt *February*. We proceed, as we promiſed, to lay before our Readers, the Contents of the ſecond Book, which conſiſts of twenty-two Chapters.

In the firſt of theſe we have the Syſtem of the World; are ſhewn how to diſtinguiſh the Planets from the fixed Stars; ſee the Cauſe of the latter's twinkling, and that they are of different Magnitudes.

In the ſecond Chapter we have the Doctrine of the Conſtellations, their Nature, Uſe, Names, and Number of Stars in each; the *Egyptian*, *Greek*, and *Arabic* Opinions and Practices relating thereto; two Ways of delineating them; the Uſe of Spheres, and Planiſpheres; an Account of the principal Catalogues that have been made of the fixed Stars, *&c.*

The thirteen following Chapters contain the Theory of the Solar Syſtem; wherein we have a great Variety of Articles about the Orbits of the Planets and Comets, the Ecliptic, Zodiac, and other Circles and Properties of the Sphere: In a Word, the principal Phænomena of our Syſtem are explained and accounted for.

In the ſixteenth Chapter it is inquired whether any of the Stars change their Places, and whether the Obliquity of the Ecliptic be variable.

The ſeventeenth and enſuing Chapters to the End treat of the Parallax of the heavenly Bodies, their Diſtances from us, their Magnitude, the Velocity of Light, the apparent Diameters of the Sun and primary Planets, the Diſtances of the Planets from the Sun,

Sun, Changes in the fixed Stars, cloudy Stars, and the like.

I will now take a more particular View of ſuch of theſe Chapters as contain any thing more curious and entertaining than what is commonly to be met with in Books of this Science.

The firſt Chapter includes an Explication of the Syſtem of the World. *The Syſtem of the World*, our Author ſays, is the whole Collection of thoſe great Bodies which compoſe the Univerſe of material Beings, and comprehends the Stars, the Sun, the Planets, and Comets, together with the indefinitely extended Space wherein they are contained. From the Author whoſe Opinion is followed, in the Deſcription of the Number, Magnitude, Situation, Motion, and other Affections of theſe Bodies, it is called the *Ptolemaic* Syſtem, the *Tychonic*, the *Copernican*, &c. In the Courſe of this Work we have a general View of the ſeveral Syſtems which have been advanced by the moſt celebrated Philoſophers and Aſtronomers, in order to account for the Appearances of the heavenly Bodies; but that which Dr. *Long* firſt explains to us is the Syſtem anciently taught by the Diſciples of *Pythagoras*, which, after long Diſuſe, was revived about two hundred Years ago by *Copernicus*, cultivated afterwards by *Galileo*, *Kepler*, and others, and greatly improved by the Diſcoveries of Sir *Iſaac Newton*. The Method he propoſes to follow in his Explication is this, "taking it at preſent for granted that this Syſtem is "the true one, he lays down the ſeveral Parts of "it, and ſhews under each Head, how the Appearances of the heavenly Bodies hitherto obſerved naturally reſult from ſuch an Order and "Diſpoſition of them as is here ſuppoſed."

Conſequent upon this our Author firſt mentions the fixed Stars. He points out their Characteriſtics. One of theſe is their *twinkling*, which is a remarkable Circumſtance

Circumſtance whereby they are diſtinguiſhed from the Planets, that ſhine with a ſteady Light. The Cauſe of this Difference ſeems to him to be this: "The "fixed Stars are at ſuch an immenſe Diſtance from "us, that their apparent Diameters are exceedingly "ſmall, ſo that every little Particle of Duſt that "floats in the Air and comes between our Eye and "any fixed Star, is big enough to cover it, and "hide it for a Moment from our Sight: Now our "Air near the Earth is ſo full of various Kinds of "Particles which are in continual Motion, that "ſome one or other of them is perpetually paſſing "between us and any Star that we look at, which "makes us every Moment alternately ſee it and loſe "the View of it; and this twinkling of the Stars "is greateſt in thoſe which are neareſt the Horizon, "becauſe they are viewed through a good deal of "thick Air, where the intercepting Particles are "moſt numerous; whereas Stars that are near the "Zenith do not twinkle ſo much, becauſe we do "not look at them through ſo much thick Air, "and therefore the intercepting Particles, being "fewer, come leſs frequently before them: As for "the Planets, they, by Reaſon of their being much "nearer to us than the Stars, have a ſenſible ap-"parent Magnitude, and that ſo great as not to "be covered by the ſmall Particles before-men-"tioned, and therefore they do not twinkle, but "ſhine with a ſteady Light." That this is a true Account of this Matter, the Doctor ſays, any one may be eaſily ſatisfied by the following Experiment: Lay a ſmall Piece of Glaſs, of about the Bigneſs of a Silver Penny, upon the Ground, between yourſelf and the Sun, with the Plane of it a little declining from the Sun, ſo that retiring from it three or four hundred Yards, you may ſee the Light of the Sun ſhining upon it to that Diſtance, or farther: If you come ſo near the Glaſs, that the Image of the Sun reflected

reflected from it appears bigger than that of the largeſt Stars in the Heavens, you will ſee it ſhine with a ſteady Light, and look like a Planet; but if you keep your Eye upon it, and go from it to the Diſtance of three or four hundred Yards, till its apparent Diameter is no bigger than that of a ſmall Star, you will perceive it twinkle in the ſame manner as the Stars do; in like wiſe if you turn your Face towards the Sun, and look upon a plowed Field, where there are many ſmall Stones, you may obſerve ſome of them that are at a Diſtance to twinkle, while others that are near, ſhine with a ſteady Light.

Indeed, ſome of the Stars appear ſo large to the naked Eye, that one would be apt to think they were too big to be coverd by the ſmall duſty Particles juſt now mentioned; but it is to be conſidered, that all luminous Bodies appear larger than other Bodies of the ſame Dimenſion, becauſe the Force, wherewith the Particles of Light emitted from them fall upon the Retina, is ſuch as to cauſe a trembling or Vibration, not only in thoſe Parts upon which the Picture is painted, but alſo in the Parts round about.

CHAP. 2. The Ancients divided the Sphere of the fixt Stars into ſeveral *Conſtellations* or *Aſteriſms*. The number of the ancient Conſtellations is 46, the number upon our preſent Globes is about 70. Thoſe our Author calls the ancient Conſtellations which we have received from the *Greeks*, particularly from *Ptolemy*: we find ſome of them occaſionally mentioned by *Homer* and *Heſiod*, but *Aratus* profeſſedly treats of them all, except two or three which were invented after his Time. However in his Account of them he falls far ſhort of the Accuracy of *Hipparchus* the *Rhodian* and of *Ptolemy*, as to the ſetting down the Places of the Stars, tho' what he writ was ſufficient for the

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uſe of Sailors and the purpoſes of Husbandry, which were the Ends chiefly propoſed by this Author, who lived about 270 Years before the birth of our Saviour, and is the Poet cited by St. *Paul*, Acts 17, 28. *Aratus* followed the Deſcriptions of *Eudoxus*, who flouriſhed about 100 Years before him; and it is very probable that the *Greek* Aſtronomers who ſucceeded him continued to uſe the ſame Figures of the Conſtellations, all along down to *Ptolemy*, though with ſome Variations and Additions.

Ptolemy's Work has been always in ſuch Eſteem among the Aſtronomers, that almoſt all who have written ſince his Time have agreed in drawing the Figures of the Conſtellations, or ſuppoſing them to be drawn, ſo as to anſwer his Deſcription of them, as far as poſſible: And indeed this is neceſſary to avoid Confuſion in comparing ancient and modern Obſervations together: Thus, for Example, the great Bear ſhould be ſo delineated, that every Star in that Conſtellation which is taken Notice of by *Ptolemy* may be in the ſame part of the Figure, *viz.* The Snout, the Eye, the Forehead, *&c.* as he deſcribes it: It does not appear, our Author ſays, that *Ptolemy* publiſhed any *Pictures of the Conſtellations*; if he did they are not come to our Hands: The oldeſt Pictures we have of them are thoſe publiſhed out of an ancient Manuſcript by *Grotius*;* but theſe, though venerable for their Antiquity, are by no means agreeable to the Originals in the Heavens.

One *Uſe of the Conſtellations* was to diſtinguiſh the Stars from one another: Thus, if we mention the Star in the Bull's northern Eye, an Aſtronomer knows what Star is meant, as well as if we pointed it out to him in the Heaven. In the infancy of Aſtronomy, only the principal Stars were taken

* *In Syntagma Aratearum.*

Notice of: Thus, at firſt only ſeven Stars were reckoned in the little Bear, and the ſame Number in the great one.

The *Conſtellations* are ſo delineated as to take in the Stars, eſpecially the moſt remarkable ones, into ſuch Parts of the Figures as are moſt eaſily diſtinguiſhed: Thus, the *Bull* is drawn ſo as to have one Star in his Southern, another in his Northern Eye; one in the Tip of his Northern, another in the Tip of his Southern Horn, *&c.* Beſides the Stars which form the Conſtellations, there are others which could not be comprehended in the Figures, but are contained in the Interſtices between them; theſe, becauſe not reduced into any certain Figure, are called *unformed Stars:* Some of theſe, which were reckoned amongſt the unformed by the Ancients, have been from time to time made into new Conſtellations by later Aſtronomers.

Several Alterations have been made in the Number and Figure of the Conſtellations, which render them, in both Reſpects, very different from what they were anciently, which Variations our Author has ſpecified. After which he ſays,

It is very probable the Stars, eſpecially ſome of the moſt remarkable Collections of them, ſuch as *Charles*'s *Wain*, the *Pleiades*, *Orion*, *&c.* were formed into Conſtellations, and had Names given them, in the early Ages of the World: Some of them, by their different Appearances, ſerve to mark out the Seaſons of the Year, and on that Account were not only taken Notice of as Directors when to begin Plowing, Sowing, and other Works of Husbandry, but were alſo thought to have a great Influence over the Temperature of the Air, and the fruitfulneſs of the Earth; ſo that, from their being Signs, pointing out the Times of the Year when Heat or Cold, Dryneſs or Moiſture are uſually predominant, they began to be looked upon as

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the Cauſes of thoſe Qualities in Bodies, and were imagined to have Dominion over Minerals, Vegetables, and Animals; over the Complections, and Conſtitutions, and even the Tempers and Diſpoſitions of Mankind. This Opinion, our Author notes, was the more eaſily entertained, becauſe the Sun, Moon, Stars, and Planets were believed to be of a Divine Nature.

The *Egyptians worſhipped the heavenly Bodies*, but eſpecially the Sun and Moon, which they called their great Gods: they thought the Sun, whom they called *Oſiris*, a proper Repreſentative of the Spirit of Nature, the Soul of the World, or the Supreme Being, who is every where preſent, exerciſing his Power over every Part of the Univerſe. The Moon, as ſhe receives her Light from the Sun, was looked upon as Female, and called *Iſis*, which Goddeſs is ſometimes made to ſignify univerſal material Nature, conſidered as paſſive, and ſuſceptible of various impreſſions, forms, and qualities; but the Moon conſidered in another View, as active, diſtributing Light and Warmth over the Face of the Earth, was ſaid to be Male: Thus *Iſis* and the Moon were counted of both Sexes. They imagined, in various Animals, ſome Properties or Qualities correſponding to the Motions, Appearances, or Influences of the Sun, Moon, or ſome of the Stars: This induced them not only to uſe thoſe Animals in their hieroglyphic Repreſentations of their Deities, but alſo to pay them divine Honours: Thus they called the *Beetle* a living Image of the Sun; they pretended that thoſe Animals roll up their Eggs in little round Pellets of Dirt, which they turn towards the Weſt, while they themſelves continue creeping on towards the Eaſt; by the firſt of theſe Motions exhibiting the Diurnal, by the ſecond, the annual motion of the Sun and Planets. Our Author here mentions divers other

Hieroplyphics of the *Egyptians*, beſides thoſe relating to Aſtronomy, and then tells us,

The *Greeks*, who learned this Science of the *Egyptians*, retained ſeveral of their Figures, as the *Ram*, the *Lion*, the *Bull*, the *Dog*, the *Triangle*, &c. but accommodated almoſt all of them to the fabulous Hiſtory of their Gods and Heroes, whom in this manner they placed among the Stars. But there is a great Diſagreement in their fabulous Relations: Thus, the *Twins* are by ſome ſuppoſed to repreſent *Caſtor* and *Pollux*, by others *Apollo* and *Hercules*, or *Triptolemus* and *Jaſon*.

It muſt be owned the Stars are capable of being reduced to figures very different from thoſe now in uſe amongſt us; thoſe Stars which are formed into the Lion might have made an Horſe or any other Animal; in fact, the Conſtellations of the Chineſe and Japoneſe are very different from ours. Some ſuperſtitious *Arabians*, though they received their Aſtronomy from the *Greeks*, have given ſome of their Conſtellations different Figures; this they are ſaid to have done becauſe they thought it unlawful to draw any Human Figure, and therefore they changed all ſuch on the celeſtial Globe into ſome other Form, and very often abſurdly enough.

Some Chriſtian Aſtronomers, diſpleaſed to ſee the Heaven of the fixt Stars poſſeſt by the Heathen Deities and Heroes, have, with much the ſame Wiſdom, propoſed to retain the ancient Figures, referring them to ſome Scripture Hiſtory: In this View they would have the Ram to be a Memorial of that which was offered inſtead of *Iſaac*, *Virgo* to repreſent the bleſſed Virgin, *&c.* Others would new model all the Conſtellations, and put them into different Forms: Thus, for the twelve Conſtellations of the *Zodiac*, they give us the twelve Apoſtles, *&c.* But this laſt Project, as our judicious

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Author obſerves, would bring intolerable Confuſion into Aſtronomy, in comparing the ancient and modern Obſervations.

Divers Catalogues have been made of the fixed Stars. Theſe contain both the Conſtellations and the unformed Stars, with the number of Stars in both, and the Place of each Star. The firſt of this Kind among the Greeks was made by *Hipparchus* of *Rhodes*, who flouriſhed about 120 Years before Chriſt. He, upon the Appearance of a new Star, began to doubt whether there might not be Changes amongſt the fix'd Stars, and therefore made a Catalogue of them, ſetting down the Place and Magnitude of each Star; that if, in after-Times, any new Stars ſhould come into View, or any of thoſe obſerved by him ſhould increaſe or be diminiſhed in Magnitude, or ſhould totally diſappear, ſuch Changes might be known to after Ages. Here we have one Uſe of a Catalogue of the Stars; another Uſe is to determine thereby the true Places and Motions of the Heavenly Bodies.

The moſt ancient Catalogue now remaining is that of *Ptolemy*, copied chiefly from *Hipparchus*, but with ſome few Alterations. He ſettles the Places of the Stars as he himſelf obſerved them, in the beginning of the Reign of *Antoninus Pius*, about A. D. 140; the Number of the Stars in this Catalogue is 1026. Several Aſtronomers ſince *Ptolemy* have made Catalogues of the Stars, computing their Places for ſome Year in or near their own Time: For an Explanation of this it is to be obſerved, "that the Place of a Star is "denoted by ſetting down its Longitude and "Latitude, and that, though the fixed Stars keep "the ſame Situation in Reſpect of one another, "the Sphere of the Heaven appears to have a "ſlow Motion, by which the Longitude of all the

" Stars is altered, at the Rate of about 50″ in a " Year, their Latitude continuing the ſame; this " renders it neceſſary for any one, who makes a " Catalogue of the Stars, and ſets down their " Longitudes and Latitudes, to ſpecify the Point " of Time for which the Catalogue is calculated."

The *Arabians* are the firſt who after *Ptolemy* obſerved the Stars, and noted down their Places.

Tycho Brahe tells us, he had, by his own Obſervations, rectified the Places of 1000 Stars, and that he put that Number upon his Globe of ten Feet Diameter: Notwithſtanding this, his Catalogue publiſhed in his *Progymnaſmata*, A. D. 1602, a Year after his Death, contains but 777 Stars, with their Places for the Year 1600. We have therein ſome Stars omitted by *Ptolemy*, tho' the whole Number falls ſhort of his, becauſe ſeveral Southern Stars which could be ſeen by *Ptolemy* at *Alexandria* in *Egypt*, are not viſible in *Tycho*'s more Northern Situation at *Uraniburg*.

About the ſame Time with *Tycho*, *William* Landgrave of *Heſſe*, aſſiſted by *Rothmannus* and *Byrgius*, obſerved the Stars, and inſerted 400 of them in a Catalogue, rectifying their Places to the Year 1593.

Bayer in his *Uranometria* publiſhed a Catalogue of 1160 Stars, compiled chiefly from *Ptolemy* and *Tycho*, together with very beautiful Figures of the Conſtellations. He has compiled his Catalogue, as our Author ſhews, in a very judicious Manner.

Kepler, who had the Uſe of *Tycho*'s Obſervations, publiſhed a Catalogue of 1000 Stars obſerved by *Tycho*, at the End of his *Tabulæ Rudolpinæ*; he adds thereto thoſe Stars of *Ptolemy*'s Catalogue which *Tycho* had omitted, together with thoſe of the new Southern Conſtellations, from other Authors: So that his whole Catalogue amounts to above 1160; their Places are computed for the Year 1600.

Hevelius

Hevelius alſo compoſed a Catalogue of 1888 Stars, whereof 1553 were obſerved by himſelf; the Places of them were computed by him for the Year 1660.

The largeſt and moſt compleat of all is the *Britiſh* Catalogue of the Stars, owing to the Labours of Mr. *Flamſteed*, Royal Profeſſor of Aſtronomy at *Greenwich*; it contains no leſs than 3000 Stars, many of which are ſo ſmall that they cannot be ſeen without the Help of a Teleſcope; the Places of them are rectified to the Year 1689.

CHAP. III. Our Author here conſiders the Solar Syſtem, and evinces the high Probability of there being a Plurality of Worlds. From this Chapter we have ſelected the following Paſſages.

The Names of the Planets included in our Syſtem, viz. *Mercury*, *Venus*, *Mars*, &c. are *Roman* Names of Heathen Gods. As Idolatry was propagated at firſt from the *Eaſt*, we muſt ſearch for the Origin of both the *Greek* and the *Roman* Names of their Deities among the *Eaſtern* Languages. Our Author makes no Queſtion, but the Planets had originally other Names given them, which were expreſſive of the Nature of their Motions, or Appearances, or of the Influences they were thought to have. Some ancient *Greek* Names, which we meet with in ſeveral Writers, ſeem to be of this Sort: There we find *Saturn*, whoſe common *Greek* Name Κρονος, *Chronos*, *Time*, was given him upon Account of the Slowneſs of his Motion, called Φαινων, *Phænon*, i. e. *Appearing* or *Shining*. He is thought to have received this Appellation, becauſe of all the Planets he is the ſeldomeſt hid by the Rays of the Sun, or elſe, his Light being the dimmeſt of them all, he was called ſo out of a ſuperſtitious Cuſtom the Ancients had of giving good Names to bad Things, for the Sake of good Luck. His ancient *Hebrew* Name is thought to be *Khiun*. He was counted unfortunate, and of a malign In-

fluence: For no better Reaſon, Dr. *Long* ſuppoſes, than for his being thought cold and dry by reaſon of his great Diſtance from the Heat of the Sun and the Vapours of the Earth, and his appearing of a pale leaden Hue; for the Aſtrologers judged of the Nature of the Planets by their Colour.

Φαεθων, *Phaethon*, is an ancient *Greek* Name of the Planet *Jupiter*. It is taken from his Brightneſs. His ancient *Hebrew* Name is thought to be *Gad*; he has other Names, *Khokhab Zedec*, the Star of Juſtice, and *Mazal Tob*, good Fortune; but theſe are of later Date. The Aſtrologers pretend he is of a benevolent Nature, as being of a middle Temperament, between the Heat of *Mars* and the Coldneſs of *Saturn*.

MARS was by the ancient *Greeks* called Πυροεις, *Pyrois*, *Fiery*; his *Perſian* and *Arabic* Names, *Azur* and *Azer*, ſignify *Fire*; all from his red fiery Appearance: The beſt Reaſon, probably, the Aſtrologers have for imagining this Planet unfortunate, and particularly to be a Promoter of War and Bloodſhed.

VENUS was called Εωσφορος, *Eoſphoros*, the Morning, and Φωσφορος, *Phoſphoros*, the Harbinger of Light, when ſhe appears in the Morning, riſing before the Sun; and Εσπερος, *Heſperos*, or the Evening Star, when ſhe ſets after him. She is thought, upon the Account of her beautiful Light, to have been the firſt of the Planets to which Religious Worſhip was paid; ſhe was adored in the *Eaſt* under various Names. The Aſtrologers count her Fortunate; the Ancients thought her to be moderately hot, by Reaſon of her Nearneſs to the Sun; and moiſt, becauſe they were ſuch Philoſophers as to fancy ſhe was near enough to the Earth to be within Reach of the Vapours aſcending from thence: Upon Account of theſe two Qualities, they imagined this to be a prolific Planet.

MERCURY

MERCURY is generally ſo near the Sun that he is ſeldom ſeen; this occaſioned him to be unknown to the *Greeks*, and conſequently unnamed by them, for ſome Time; they called him Στιλβων, *Stilbon*, from his bright ſhining, his Light being exceedingly vivid and ſparkling beyond the reſt of the Planets: The Aſtrologers think him to be of an indifferent Nature, of good or bad Influence according to the Quality of the Stars and Planets with which he is in Conjunction.

The Sun was called by the *Phenicians*, *Beel Samen*, the Lord of Heaven; his common *Greek* Name *Elios* is derived from *El*, one of the Names of God: His moſt ancient Name is *Shemeſh*, a Miniſter or Servant, from his being conſtantly employ'd in the Service of the World, or rather from his being the Servant or Miniſter of the Creator, to diſtribute Heat and Light over the Earth. He had other Names from his Heat, *khamma*, *pire*, or from his Light, as *Orus*, *Phœbus*, *Phanes*; the Name *Mithra*, by which he was known among the *Perſians*, is by *Voſſius* derived from *Mither*, which in their Language ſignifies Great; but *Hyde* derives it from *Mihr*, Love or Mercy, becauſe the whole World is cheriſhed by it. This learned Author has made it appear from their own Writings, that the *Perſians* did not worſhip the Sun, but only conſidered him as a glorious Light, and ſo the fitteſt Symbol of the Divinity; and therefore they paid him, not divine Adoration, but only a civil Reſpect, as they did alſo to the Fire. But our Author at the ſame Time very juſtly ſuppoſes, that, whatever the wiſer Sort among them might practiſe themſelves or teach others, many of the common People worſhipped both the Sun and the Fire: "The Expe-
"rience of all Times and Places ſhews how apt
"Men are, eſpecially the Vulgar, to paſs from the
"Uſe of Symbolical Repreſentations of the Divi-
"nity

" nity to the Worſhip of the Symbols themſelves." But whatever the *Perſians* did, it is certain that other Nations worſhipped the Sun by the name of *Mithra*. The *Greeks* are ſaid to have had a Temple at *Alexandria* where they offered human Sacrifices to him, and there are ſeveral *Roman* Inſcriptions remaining, wherein *Mithra* is ſtiled the invincible, almighty, and moſt holy God.

The Names of the Moon, Σελήνη, *Selene*, in *Greek*, and *Luna* in *Latin*, are both derived from Words which ſignify Light; one of her Names in *Hebrew* *Lebanah* is from her Whiteneſs, another *Yareakh* is, as ſome tell us, from a Word which ſignifies to refreſh; becauſe ſhe was thought to refreſh the Earth with her Influences.

The Dominion of the heavenly Bodies was fancied by ſuperſtitious Antiquity to be ſo extenſive, that the Sun, Moon, and Planets, had each of them a particular Conſtellation or Portion of the Heaven aſſigned to it, wherein when they were poſited they were ſuppoſed to be moſt powerful in their Influence; and were therefore ſaid to be in their Exaltation: As when in the oppoſite Part of the Heaven, they were ſaid to be in their Fall or Detriment, and thought weak. Beſides this, every one of them had its peculiar Colour, Metal, Stone, Tree, Plant, Fruit, Flower, Animal, Number, Day, Hour, *&c.* aſſigned to it; from whence are derived the ſuppoſed Virtues of *Amulets* and *Talliſmans*: The Dealers in theſe Fooleries pretending a Sympathy between the heavenly Bodies and the Things under their Dominion, ſo that that Plant, Metal, Colour, *&c.* over which any Planet preſides, has reciprocally a Power of attracting the Influences of that Planet.

Zabiiſm, or the Worſhip of the Hoſt of Heaven was the moſt ancient Kind of Idolatry, the Cuſtom of deifying dead Men was later, though that alſo is very ancient. When this Practice began, it was uſual

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to make the People believe the departed Hero was gone to take up his Reſidence in the Heaven or in one of the heavenly Bodies, which upon this Occaſion was conſecrated to him: from hence came the *perſonal Names of the Planets*, as we may call thoſe in common Uſe, becauſe they were taken from Perſons deified; though, after the Planets had receiv'd thoſe perſonal Names from deified Heroes, the reverſe of this became cuſtomary, and Princes and great Men frequently took their Names from the Planets. The moſt ancient Author now remaining who mentions any Names of the Planets, calls that neareſt the Sun, the Star ſacred to *Hermes*; others called it the Star of *Apollo*. *Mars* was by the *Egyptians* called the Star of *Hercules*, by the *Babylonians Thurras*; the God *Mars* was in the ancient *Etruſcan* Language called *Turan*; but it is not certain the Planet was called by that Name. *Venus*, which was by ſome named the Star of *Juno*, among the *Egyptians* was called the Star of *Iſis*, as *Jupiter* was the Star of *Oſiris*. The Sun, as one of the *Heathen* Deities, had the Names of *Apollo*, *Phœbus*, *&c.* The Moon, as a Goddeſs, had great Variety of Names, *Iſis*, *Diana*, *Hecate*, &c.

This Diverſity of Names ariſes from different Perſons having had the ſameStar conſecrated to them. The *Greeks* applied thoſe Stories to their own Heroes which the *Egyptians* did to theirs. It may be obſerved farther, that a great deal of the Confuſion which we find in the Hiſtories of the *Heathen* Gods, is owing to this, that the Ancients, at different Times, deified various Perſons under the ſame Name: Thus there were ſeveral *Mercurys*, *Mars's*, *Venus's*, *Apollo's*, *&c.* and ſuch a Number of *Jupiters*, that *Varro* is ſaid to have reckon'd up no leſs than 300. Again, when any of the Eaſtern or Northern Nations are ſaid by the Ancients to have worſhipped any of the *Grecian* or *Roman* Deities,

Deities, as *Hermes*, *Jupiter*, *Apollo*, *Saturn*, we muſt not imagine they worſhipped them under the *Greek* or *Roman* Names; but the Writer in that Caſe calls the Idol by the Name of ſome Deity of his own Country, which came the neareſt to it in the fabulous Account of its Actions, Power and Influence, and in the Kinds of Worſhip which uſed to be paid to it: Thus, whereas the northern Nations anciently adored the God whom they imagined to preſide in Battle, and to be the Diſpoſer of Victory, a *Roman* Writer would tell us they worſhipped *Mars*; in like Manner, if a *Grecian* Hiſtorian were to ſpeak of the *Egyptians* paying divine Honours to *Thoth*, as the Inventor of Letters, Arithmetic, and ſeveral other Arts, he would ſay they worſhipped *Hermes*.

CHAP. XV. There are two curious aſtronomical Poſitions that have been debated by the moſt Learned in this Science, whoſe Opinions concerning them our Author has collected in this fifteenth Chapter. One of theſe is, that the Stars are ſo fixed as to keep their Places immoveably; the other, that the Orbit of the Earth continues unalterably in the ſame Plane, and conſequently that the Ecliptic is invariable. As to the firſt of theſe Poſitions, *Ptolemy* has a Chapter on Purpoſe to prove that the Stars are fixed, and inſtances a conſiderable Number of Stars which he found to lie in right Lines with one another, or to form Triangles and other Figures, exactly in the ſame Manner as *Hipparchus* had deſcribed them, above 260 Years before him. *Tycho* not only found thoſe Stars to keep their Places in Reſpect of one another, but ſeveral others alſo to anſwer ſo exactly to that Deſcription, that he declares it to be his Opinion, that all the Differences, which he found between the Diſtances of ſome Stars from one another, as they were obſerved by himſelf, and as they are

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ſet down by the Ancients, are owing, either to the Inaccuracy of the Obſervations of the Ancients, and the Imperfection of their Inſtruments, or to the Miſtakes of Tranſcribers. On the other-Hand, Dr. *Halley* has obſerved, that the Bull's Eye, *Sirius*, and *Arcturus*, are now found to be above half a Degree more ſoutherly than the Ancients reckon'd them; that this Difference cannot ariſe from Errors of Tranſcribers, becauſe the Declinations of thoſe Stars, ſet down by *Ptolemy*, as obſerved by *Timocharis*, *Hipparchus*, and himſelf, ſhew their Latitudes given by him are ſuch as thoſe Authors intended: that it is hardly credible, thoſe three Obſervers could be deceived in ſo plain a Matter. To this he adds, that the bright Star in the Shoulder of *Orion* has in *Ptolemy* almoſt a whole Degree more ſoutherly Latitude, than at preſent; that an ancient Obſervation, made A. D. 509, at *Athens*, of an Appulſe of the Moon to the Bull's Eye, ſhews that Star to have had leſs Latitude at that Time than it now has; that as to *Sirius*, it appears by *Tycho*'s Obſervations that he found him four Minutes and a half more northerly than he is at this Time. Theſe Obſervations compared together, ſeem to favour an Opinion, that *ſome* of the Stars *have a Motion of their own*, which changes their Places in the Sphere of the Heavens. This Change, if any ſuch there really be, would require about 1800 Years to become ſenſible, and would be ſooneſt diſcover'd in ſuch Stars as thoſe juſt now mention'd; becauſe they are all of the firſt Magnitude, and may therefore probably be ſome of the neareſt to our Syſtem.

As to the ſecond Poſition, that *the Ecliptic is invariable*, *Tycho* brings ſeveral Inſtances of Stars whoſe Latitudes he found to be different from what they were in *Ptolemy*'s Catalogue, and ſays that, according to his Obſervations, the Latitudes of the northern Stars have increaſed, and the Latitudes of the ſou-

ſouthern Stars decreaſed; and that this Increaſe and Decreaſe of Latitude is greater or leſs in different Stars, according as they are nearer to or farther from the ſolſtitial Colure. This would imply ſuch a Change in the Plane of the Earth's Orbit as cauſes the northern Parts of the Ecliptic to recede from the North-Pole, and the ſouthern Parts to recede from the South-Pole.

In Truth, as our Author notes, if we conſider the mutual Attraction of the heavenly Bodies, we cannot think it impoſſible that both the Plane of the Earth's Orbit, and the Planes of the reſt of the Planets ſhould be ſubject to ſome Alterations; but that there has been an actual Change in any of theſe, we cannot reaſonably conclude, without Proof from Obſervations. In this Inquiry four Things are to be conſidered in the Orbit of every Planet; 1. The Excentricity, 2. The Place of its Aphelion, 3. The Place of its aſcending Node, 4. The Inclination of its Plane to the Plane of the Orbit of any of the other Planets. It has been the Opinion of many great Aſtronomers that all theſe continue invariable in Reſpect of the fixed Stars: ſome aſſign to the Nodes and Aphelia a very ſlow Motion; but this Opinion ſeems to have been built on ſome preconceived Hypotheſis, rather than any actual Diſcovery of ſuch Motion: Perhaps the Aphelion of *Saturn* may be excepted from this Remark, which according to *Maraldi*, has a Motion of about a Minute in a Year, according to the Order of the Signs; and the Nodes of *Jupiter*, which the ſame Author makes to go backwards at the Rate of about $37''$ in a Year.

As to the Planes of the planetary Orbits, we have no Obſervations to ſhew that any of them was ever inclined to the reſt in a different Angle from what it is at preſent. On the contrary, two Occultations of

of the ſame Star by the Planet *Mars*, obſerved at the Diſtance of 1934 Years from one another, the Earth being at the Time of both Obſervations very nearly in the ſame Place of her Orbit, make it extremely probable that the Planes of both the Orbit of *Mars* and of the Earth had continued in the ſame Situation during that long Interval.

The Queſtion, whether any of the fixed Stars change their Places with regard to one another, is a very curious one, which our learned Author thinks worthy of a thorough Diſcuſſion. He proceeds with it therefore, and ſays, if the Diſtances of ſeveral Stars from one another were at any Time to be taken exactly, and, after a conſiderable Number of Years, the ſame Diſtances were to be carefully meaſur'd again, it ſeems to be a likely Way to diſcover whether the Stars ſo obſerved change their Places or not. The Ancients have given us nothing of this Kind; *Tycho* and the Prince of *Heſſe* were the firſt who left us any Diſtances taken with good Inſtruments; and their Accounts agree ſo well together, as give us reaſon to believe they are as exact as could be expected from plain Sights. Dr. *Long* has compared a great Number of their Diſtances, particularly thoſe of the brighteſt Stars, with Obſervations of the ſame Diſtances taken by later Aſtronomers, and found no ſuch Change in any of them as will ſhew that any of the ſaid Stars have chang'd the Places they were in 100 Years before. But in *Arcturus*, he tells us, the Caſe at firſt appeared to be different; *Hevelius* ſets down the Diſtance of that Star from *Lyra* 4′ greater than *Tycho* had obſerved it, 72 Years before him; and *Flamſteed*, 22 Years after, meaſur'd the Diſtance between the ſame two Stars ſtill 3′ greater than *Hevelius* found it; ſo that, if *Lyra* ſtood ſtill all the while, there was an Appearance of *Arcturus* having gone 7′ out of his Place in 100 Years. It ſeem'd ſome Confirmation of this

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Motion of *Arcturus*, that *Flamſteed* found his Diſtance from the Head of *Hercules* 3′ greater than it is ſet down by the Prince of *Heſſe*, and that his Diſtance from the *Lions-Tail* was a little decreaſed. But, after all this, our judicious Author conſidering ſeveral other Stars to the North of *Arcturus*, from which he muſt have grown more diſtant, if he had really had any ſuch Motion, and ſeveral Stars to the South of him, to which ſuch a Motion would have made him approach nearer: The Diſtances of *Arcturus* from theſe Stars being calculated from their Longitudes and Latitudes in the different Catalogues of *Tycho*, the Prince of *Heſſe*, *Hevelius*, and *Flamſteed*, he found that very few of them agreed with the ſuppoſed Motion of *Arcturus*, but that the greateſt Part of them came out ſuch as ſhewed he had kept his Place. So that, upon the whole, Dr. *Long* is inclined to think the *Stars keep their Places immoveably*.

It has been diſputed whether *the Obliquity of the Ecliptic* be *variable* or not; that is, whether the Angle between the Planes of the Ecliptic and the Equator continues unchangeably the ſame, or is ſubject to Alteration: It is alſo diſputed among thoſe Writers who hold it liable to Change, whether that Change be regular or irregular. It is certain, our Author ſays, that the Obliquity of the Ecliptic is at preſent found to be above a third Part of a Degree leſs than *Ptolemy* has given it us. If we enter into a Detail of all the Obſervations of it which were made from *Ptolemy*'s Time down to *Tycho*, we ſhall find that later Obſervers have generally found it leſs than thoſe who went before them; tho' there are ſome Inſtances of later Obſervations having made it a few Minutes greater than ſome preceding ones. They who hold the Immuta-

Immutability of the Ecliptic, get rid of all theſe Difficulties, by throwing upon the Inaccuracy of the Obſervations of the Ancients, and the Imperfection of their Inſtruments, all the Differences between them and the Moderns in this Affair. But tho' it may be allow'd they were neither ſo exact, or had ſo good Inſtruments for obſerving as we, yet it can hardly be imagined they could be ſo greatly miſtaken in a Matter ſo eaſy to be known, and ſo well deſerving their Attention. Some have fancied the Obliquity of the Ecliptic is ſubject to a ſort of Libration, increaſing in ſome Ages, and decreaſing in others. Some have thought that the Obliquity of the Ecliptic has been always gradually decreaſing, the Planes of the Ecliptic and Equator growing continually nearer to Coincidence. This Opinion, our Author ſays, is countenanced by a Compariſon of ancient and modern Obſervations, and by the Conſideration of the Shape of the Earth.

After a curious Detail of the Sentiments of M. *Louville*, *De la Hire*, M. *Godin*, and others, about this Matter, our Author ſays, If there be any Change in the Obliquity of the Ecliptic, which he thinks to be very probable, it may be cauſed either, 1. By a Change in the Inclination of the Earth's Axis, the Plane of the Earth's Orbit continuing immoveable; or, 2. By a Change in the Plane of the Earth's Orbit, the Axis of the Earth continuing parallel to itſelf; or, 3. By a Change both in the Inclination of the Axis and in the Situation of the Orbit of the Earth. The firſt of theſe ſeems moſt likely to be the Caſe: For if we conſider *the Shape of the Earth*, that it is *an oblate Spheroid*, or a Globe a little flatted like a Turnep; and that, by Reaſon of this Figure of the Earth, the Attraction of the heavenly Bodies will act upon it in the ſame manner as if it had a Ring round the Equator; and that the Sun, being in the Plane of the Ecliptic, is perpetually

pulling this Ring, or the protuberant Parts about the Equator of the Earth, towards a Coincidence with the Plane of the Ecliptic; which Action of the Sun, together with the like Attraction of the Moon, is the Cauſe of the Preceſſion of the Equinoxes: If, I ſay, we conſider all this, it will not appear improbable, that theſe Actions of the Sun and Moon, which have a continual Tendency to bring the Plane of the Earth's Equator nearer to the Plane of the Ecliptic, ſhould gradually diminiſh the Angle between thoſe Planes. The Moon, indeed, being nearer to the Earth, contributes more than the Sun towards this Effect, by her Attraction; for tho' ſhe is but twice a Month in the Ecliptic, yet ſince ſhe is always near it, never deviating much above 5° from that Circle, and theſe Deviations are as much towards the North in one half of her Period round the Earth as they are towards the South in the other, they will ſo ballance one another, that the Effect of the whole Attraction of the Moon will be pretty much the ſame as if ſhe were carried round the Earth exactly in the Plane of the Ecliptic. Dr. *Long* does not here abſolutely exclude all Change in the Poſition of the Ecliptic; for, as the Planets move round the Sun in different Planes, their mutual Attractions muſt have a Tendency to change the Situation of all their Planes, and bring them nearer to a Coincidence with one another: But then the Diſtance of the Planets from each other is ſo great, that the Change here mentioned may be ſo exceedingly ſmall as not to become ſenſible in many Ages.

The Doctor has given us a Table of the Obliquity of the Ecliptic, taken chiefly from *Ricciolus*, *Flamſteed*, and *Louville*, ſhewing what it has been Obſerved to be, by different Aſtronomers, in the ſeveral Ages of the World, from the moſt ancient Times wherein we have any Records

cords of its having been meaſured, down to the lateſt Obſervations thereof: A View of it, he ſays, may induce us to think, that the Angle between the Planes of the Equator and Ecliptic is leſs now than formerly, and that it is continually decreaſing.

CHAP. XVII. The PARALLAX of the heavenly Bodies is very copiouſly treated of in the ſeventeenth Chapter of the ſecond Book of this Work.

One *Uſe* of the Knowledge of *Parallaxes* is to find the true Place of a Phænomenon. In all Obſervations of the heavenly Bodies, it is neceſſary to know how much they are depreſſed by Parallax, that by adding ſo much to their Apparent we may have their True Altitudes. Indeed in all of them, except the Moon, the Parallax is ſo ſmall, that, in moſt Caſes, we need not take any Account of it; but then to know it is thus ſmall is of good Uſe, to prevent our falling into the Miſtakes, and help us to correct the Obſervations of thoſe who have ſuppoſed it too great; as all Aſtronomers till of late have done: Thus, *Ptolemy* ſettled the horizontal Parallax of the Sun, when in Perigee, about $3'$; as *Tycho* did alſo; *Kepler* diminiſhed it to $1'$; but, by the lateſt and beſt Obſervations, it is found not to exceed $10''$

Another *Uſe* of *Parallaxes* is to find the Diſtance of the heavenly Bodies from the Earth. Thus, the horizontal Parallax of any one of them being known, its Diſtance from the Earth may be found; the Method of which our Author has ſhewn in the Introduction to this Volume, *p.* 30, *&c.*

The Moon being the neareſt to the Earth of all the heavenly Bodies, her Parallax is the greateſt, and conſequently the moſt eaſy to be determined; it amounts to about a whole Degree. The Sun and all the primary Planets, except *Mars* and *Venus* when in Perigee, are at ſo great Diſtances from the Earth, that their Parallax is too ſmall to be obſerved.

ſerved. When *Mars* is in Oppoſition to the Sun, his Diſtance from the Earth is but half of the Sun's Diſtance; and conſequently his Parallax is then double to that of the Sun. *Tycho*, in the Year 1682, endeavoured with incredible Diligence to diſcover the Parallax of *Mars* in Oppoſition; but *Kepler*, having examined *Tycho*'s Obſervations, concluded from them that *Mars*'s Parallax was ſcarcely ſenſible.

The Meridian Altitudes of *Mars* in Perigee were obſerved at the ſame Times, at *Paris* by *Caſſini* and at *Cayenne* by *Richer*, and the horizontal Parallax of *Mars* computed from thence. — Theſe Obſervations were made in *September* 1672: By the firſt Obſervation, *Sept.* 5, *Mars* appeared 12″; by the ſecond Obſervation, *Sept.* 9, 13″; by the third, *Sept.* 24, 17″ more ſoutherly, at *Paris*, than he would have done, at the ſame Moment, under the ſame Meridian, in the Latitude of *Cayenne*: *Caſſini* ſays that the third Number ſhould have been leſs than the ſecond, becauſe *Mars* was a little farther from the Earth at the Time of the third Obſervation than at the ſecond, and therefore his Parallax ſhould have been leſs; but an Error of a few Seconds is unavoidable in ſuch Obſervations: He thought the beſt Way was to ſplit the Difference between the ſecond and third Obſervations, and make the Parallax of *Mars*, owing to the Difference between the Latitudes of *Paris* and *Cayenne*, 15″; from whence the horizontal Parallax of *Mars* at that Time is by Calculation 25″ $\frac{1}{3}$.

Mars is neareſt to the Earth, and his Parallax the greateſt of all, when he is in Oppoſition at the ſame Time that he is in Perihelion; ſuch was his Situation in the Year 1672, when *Caſſini*, from the aboveſaid Obſervations, determined his horizontal Parallax to be 25 $\frac{1}{3}$: Theſe Obſervations of *Caſſini* were confirmed by thoſe of *Maraldi*, made in the Year

Year 1704, and again in the Year 1719; from which he concluded the Sun's Parallax to be 10″, as *Caſſini* had ſettled it in ſeveral Places of his Writings. At the Time of *Caſſini*'s Obſervations the Diſtance of *Mars* from the Earth was to the mean Diſtance of the Sun from the Earth, as $25\frac{1}{3}$ to $9\frac{1}{2}$; the Parallaxes of any two Phænomena are reciprocally as their Diſtances, and therefore, if the Parallax of *Mars* be $25''\frac{1}{3}$, the Sun's Parallax at his mean Diſtance comes out $9''\frac{1}{2}$; inſtead of which the round Number 10″ is uſually aſſign'd for the Sun's Parallax.

Venus in Perigee is ſo near the Sun, that her Parallax cannot be eaſily diſcovered by comparing her with any fixt Stars. She may ſometimes in Perigee be ſo near one of her Nodes as to appear upon the diſk of the Sun; thus ſhe was ſeen *November* 24, A. D. 1639, only at *Hoole* in *Lancaſhire* by *Horrox*, and at *Mancheſter* by his Friend *Crabtree*, to whom he had before hand given Notice of that uncommon Appearance. *Venus* will not be again viſible upon the Sun's Disk, till *May* 26, 1761, and then, if the Time of her Tranſit be obſerved by different Perſons, in different Parts of the Earth, in the Manner deſcribed by Dr. *Halley* in the *Philoſophical Tranſactions* Number 348, her Parallax from the Sun, *i. e.* the difference between her Parallax and the Sun's, may be determined, to a Degree of Accuracy not to be hoped for from any other Method.

The Parallax of a Phænomenon, if ſenſible, may be found by one Obſerver only, by marking the apparent Difference of its Situation, in reſpect of fix'd Stars that are near it, at different Hours of the ſame Night. After deſcribing how this Problem is to be wrought, our Author tells us,

The *annual Parallax* of a Phænomenon is the change of its apparent Place in the Sphere of the

Heaven, which is cauſed by its being viewed from the Earth in different Parts of her Orbit. The annual Parallax of all the heavenly Bodies, except the fix'd Stars, is conſiderable: It is the Motion of the Earth through the different Parts of her Orbit that cauſes the Sun to appear every Day of the Year in a different Point of the Ecliptic; and it is from the ſame Cauſe, namely our continually changing our Station, that the Geocentric Places of the Planets are almoſt always different from what they would be if they were viewed from any fix'd Point in the Orbit of the Earth: As our Author has evinced in the 8th, 9th, and 10th Chapters of this Book. The Reaſon of this is plain, the Diameter of the Earth's Orbit bears a conſiderable Proportion to the Semidiameters of the Orbits of the moſt diſtant Planets, being more than a 5th Part of the Semidiameter of the Orbit of *Saturn*, and above a 3d of the Semidiameter of *Jupiter*'s Orbit; but it bears ſo ſmall a Proportion to the Semidiameter of the Sphere of the Heaven, or the Diſtances of the fixt Stars from us, that, if they have any ſenſible Parallax, it is exceedingly ſmall. What Attempts have been made to diſcover it, and with what Succeſs, our Author informs us in the Eighteenth Chapter, ſome Paſſages of which are here under cited.

CHAP. XVIII. Since the Revival of the ancient Opinion of the Earth's annual Motion round the Sun by *Copernicus*, ſeveral Aſtronomers have endeavoured to find out whether the fixed Stars are ſubject to any annual Parallax or not. This Inquiry very well deſerves our Attention, on two Accounts; 1. if ſuch Parallax could be diſcovered, it would demonſtrate the Truth of the *Copernican* Syſtem: 2. if the Quantity of the annual Parallax of any of the fixt Stars could be found, the Diſtances of thoſe Stars from our Earth might be known.

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The Axis of the Earth extended, being carried parallel to itſelf during the Earth's annual Revolution round the Sun, in reality deſcribes a Circle in the Sphere of the fixt Stars equal to the Orbit of the Earth: But though the Orbit of the Earth, and conſequently the foreſaid Circle be immenſely great, many Millions of Miles in Diameter, it is but a Point in Compariſon of the Sphere of the Heaven; that is, the Angle under which its Diameter appears to an Inhabitant of the Earth is inſenſible, leſs than can be meaſured by any Obſervation; and therefore the celeſtial Poles appear to be in the ſame Points of the Heaven throughout the Year.

We have ſeen the Parallax of the Sun to be no more than 10″; this ſmallneſs of the Sun's diurnal Parallax is owing to this, that the Semidiameter of the Earth bears an exceedingly ſmall Proportion to the Semidiameter of the Earth's Orbit, being not more than a 20,000 Part of it, for ſo many Semidiameters of the Earth is the Sun diſtant from us. The Diſtance of the Sun may yet be inconſiderable when compared with the vaſtly greater Diſtance of the fixed Stars. If we ſuppoſe the Diſtance of the neareſt Star to be 20,000 Times as great as the Sun's Diſtance from us, the annual Parallax of that Star would be no more than 10″, too little to be diſcovered by any of the Methods made uſe of to take the height of the Pole by the Stars: The Diſtance of the neareſt Stars may be much greater than this, and their Parallax conſequently much leſs than 10″; it is no wonder therefore that Aſtronomers have found the height of the Pole in every Place to be the ſame throughout the Year: but ſome have been too haſty in concluding from thence that the Earth has no ſuch annual Motion round the Sun as the Followers of *Copernicus* ſuppoſe.

If the annual *Parallax* of any fix'd Star were ſenſible, that Star would appear to change its Place ſo as to deſcribe a very ſmall Ellipſis in the Sphere of the Heaven, in a Year's time. If the Star were in the Pole of the Ecliptic, the Ellipſis deſcribed by it would have the ſame excentricity with the Orbit of the Earth; and conſequently would differ very little from a Circle. If the Star be at any Diſtance from the Pole of the Ecliptic, the greater that Diſtance is the more oblong will the Ellipſis be: If the Star be in the Plane of the Ecliptic, the Ellipſis may be ſaid to be infinitely ſmall in breadth, for it will become a ſtrait Line, wherein the Star will appear to go, according to the Order of the Signs, one half of the Year, and contrary to the Order of the Signs, during the other half.

The greater the Diſtance of the Star is from the Earth the leſs will the Ellipſis appear: If the Diſtance of the Star be ſo great that the Ellipſis becomes as a Point, the annual Parallax is ſaid to be inſenſible; that is, no Change of Place is diſcoverable in the Star, throughout the Year.

Our Author forbears entering into a Detail of all the various Changes which their Aberrations in an elliptic Curve, above mentioned, muſt cauſe in different Stars, according as they are differently ſituated in the Sphere of the Heaven, in reſpect of the Ecliptic and Equator: It is ſufficient at preſent to remark, that ſuch Aberration of any Star muſt change is Longitude and Latitude; now both theſe are found not directly and immediately, but by its Declination and right Aſcenſion: The Declination of a Star is found by taking its meridian Altitude, the height of the Equator being firſt known: The right Aſcenſion of a Star is found by the time of its coming to the Meridian. Thus we have pointed out to us two Methods of inquiring into the annual

Aberration

Aberration or Parallax of the Stars: One, by obſerving whether or no any Change can be diſcovered in the meridian Altitudes of the ſame Star at different times of the Year; the other, by examining whether the Intervals of Time between any two Stars coming to the Meridian are equal throughout the Year. If there be any ſenſible change of Declination in any of the Stars, it muſt be greateſt, and conſequently moſt eaſily diſcovered, in thoſe that are near the Pole of the Ecliptic: But the change of right Aſcenſion here inquired after muſt be greateſt in Stars in the ſolſtitial Colure, and neareſt the Pole of the Equator: Our Author has treated of both theſe Methods in their Order. He ſays,

Galileo ſeems to be the firſt who thought of trying whether any annual Parallax of the Stars were diſcoverable or not: To this Purpoſe, ſuppoſing the Stars to be at different Diſtances from us, and thoſe Stars to be neareſt to us that appear the biggeſt, he ſuggeſts, that by obſerving with a Teleſcope two Stars very near to each other, one of the greateſt the other of the leaſt Magnitude, their apparent Diſtance from one another might perhaps be found to vary, as they were viewed, at different times of the Year, from the Earth, in different parts of her Orbit. The ſame Author propoſes alſo a Method whereby we may not only diſcover whether a Star has any ſenſible Parallax or not, but determine the Quantity of it alſo, and conſequently know the Diſtance of the Star from us: The Method is this, upon the top of ſome very high Building let a ſmall ſtrait Bar be fixed parallel to the Horizon, and perpendicular to the Meridian; recede from it towards the North till you can ſee the Bar juſt cover or paſs exactly through the Center of ſome Star when it is in the Meridian; then upon a Wall, or ſome ſtrong

Poſt

Poſt well fixed, place a Mark exactly at the Height of your Eye; thus you will have in effect a very large Inſtrument with Sights placed in the Meridian, ſufficient to diſcover the leaſt Alteration in the Meridian height of the Star, by obſerving it from Month to Month, but chiefly when it is at its utmoſt North and South Limits. "But in "taking meridian Altitudes by this or any other "Inſtrument, in order to diſcover the annual "Parallax, the Stars obſerved muſt be ſuch as "paſs our Meridian not far from the *Zenith*; "otherwiſe the variableneſs of Refraction will "render the Obſervations too uncertain for that "Purpoſe: And therefore *Halley* juſtly remarks, "that, whereas a difference of about 6 ſeconds in "the Meridian height of Sirius had been obſerved "at *Paris*, no Concluſion can from thence be "drawn about the annual Parallax; becauſe at "*Paris* the Meridian height of Sirius is under "25°. at which height Refraction will vary 7 or "8 Seconds, which is more than the whole Pa-"rallax ſuppoſed to be obſerved amounts to."

Another way to attempt the Diſcovery of the annual Parallax, by the change of Declination of the fixt Stars, is to view, through a Teleſcope placed perpendicular to the Horizon, ſome Star in or near the ſolſticial Colure that paſſes through the Zenith or very near to it; if the Parallax of the Star be ſenſible, there will at different Times of the Year appear a difference in its meridian Altitudes; and its Altitudes at the two ſolſtices will differ moſt from each other: Thus a Star that in *June* paſſes through the Zenith of any Place in North Latitude will in *December* paſs Southward from the Zenith, and a Star that in *December* paſſes through the Zenith in ſouth Latitude will in *June* paſs Northward from it. *Hooke* was the Inventor of

this

this Method, and in the Year 1669 put it in Practice at *Greſham College*, with a Teleſcope 36 Feet long, and gave an Account of the Proceſs in one of his *Cutlerian* Lectures. His firſt Obſervation was *July* 6, when the bright Star in the Head of Draco, marked by *Bayer*; with the Letter γ paſſed about 2′ 12″ northward from the Zenith: The ſecond was *July* 9, when that Star paſſed at the ſame Diſtance from the Zenith as before: The third Obſervation was *Auguſt* 6, when the Star paſſed northward from the Zenith about 2′ 6″: The fourth and laſt was *October* 21, when the tranſit of the Star was 1′ and 48 or 50 Seconds north from the Zenith.

In 1689 *Flamſteed* began the Obſervations from whence he deduced the annual Parallax; a Detail whereof we have in a Letter of his to Dr. *Wallis*.— He ſays that, by ſeven Years continual Obſervations, he found the Pole Star nearer to the Pole in *December*, than in the Months *April*, *May*, *July*, *Auguſt*, or *September*: And that its apparent Diſtance from the Pole was greater in *April* than in *September*, and greater in *July* and *May* than in *April*. He could not obſerve that Star in *June*, becauſe it then comes to the Meridian near the ſame Time the Sun does, but concludes, from his Obſervations in other Months, that its apparent Diſtance from the Pole in *June* muſt be different from that in *December* about 40″ or 45. But tho' ſome have thought theſe Obſervations ſufficiently demonſtrated a ſenſible annual Parallax, *Flamſteed* himſelf ſpeaks of them with a good deal of Diffidence; he ſays indeed that he could be ſure of taking the height of the Star ſo near as 5″, provided he could be certain the Diviſions of his Inſtrument were accurate enough; but this he juſtly makes a Doubt of. He adds, that he thought he diſcovered an annual Parallax in ſome of the ſouthern

Stars

Stars alſo; but rightly remarks, that the variableneſs of Refraction might occaſion all the Differences he found in their Meridian Altitudes. He mentions alſo ſome Obſervations of Sirius, from which the annual Parallax of that Star would come out near 30″, but declares he will not anſwer for the exactneſs of thoſe Obſervations which were many of them made by his Aſſiſtant.

Mr. *Whiſton*, from the Obſervations of *Hooke* and *Flamſteed*, computes that the greateſt annual Parallax, or that which a Star in the Pole of the Ecliptic would have, is 47″; from whence he calculates the Diſtance of the Stars to be about 9000 Semidiameters of the Earth's Orbit, or 500000000000 Miles: A prodigious Diſtance this; but Mr. *Bradley* in a Letter to Dr. *Halley* tells him, he believes he may venture to ſay, that in two of the Stars obſerved by him the Parallax does not amount to two Seconds; and that, he is of Opinion, if it had been ſo much as one Second, he ſhould have diſcovered it, by the great Number of Obſervations made by him, eſpecially of the Star *γ Draconis*: This, inſtead of 9000 Times, makes the Diſtance of the Stars from us 400,000 Times as great as that of the Sun; which is above 40 Times as great as the Diſtance calculated from *Flamſteed*'s Obſervations.

In the Year 1725 Mr. *Molyneux*, aſſiſted by Mr. *Bradley*, with a Teleſcope of above 24 Feet placed perpendicularly at his Houſe at *Kew*, began to obſerve the ſame Star in *Draco* that *Hooke* had done, in hopes of verifying what he had communicated to the Public; but their Obſervations came out ſo contrary to what they expected, as to be Matter of great ſurpriſe to them, and gave them Reaſon to call in Queſtion the Accuracy of *Hooke*'s Obſervations, ſince they muſt have been liable to an Error of at leaſt 30 Seconds. Our Author having

having ſpecified the Obſervations made at *Kew*, tells us, they afford a ſufficient Proof that the apparent Change of Place in thoſe Stars which were the Objects of them was not owing to a *Nutation of the Earth*'s *Axis*; ſince, if that had been the Cauſe, the Alteration in both the Stars there obſerved would have been nearly equal, they both being ſituated near the ſolſtitial Colure, which was not the Caſe.

In the Year 1727 Mr. *Bradley*, with a Teleſcope of $12\frac{1}{2}$ Feet, began the like Obſervations at *Wanſtead* in *Eſſex*. After a Year's Obſervations, made with the utmoſt Care and Exactneſs, and with an Inſtrument very favourably circumſtantiated for the Purpoſe, he judged the Change of Place in Stars, taken Notice of by himſelf and others, to ariſe from theſe two Cauſes, 1. The progreſſive Motion of Light being in Time, 2. The annual Motion of the Earth in her Orbit. Our Author's Illuſtration of this Matter is very Curious, but it would be unintelligible to my Readers, here, without the correſponding Diagrams: Beſides, it is my Intention only to ſet before them ſome of the more generally entertaining Paſſages that occur in this valuable Work. I therefore add nothing further on this Subject but this, that as Mr. *Bradley*'s Hypotheſis relating to the Cauſes of the apparent Change of Place of the fixed Stars, is verified by a long Courſe of the moſt accurate Obſervations that perhaps ever were made, we may be pretty ſecure that the ſaid Hypotheſis gives at leaſt the true Law of the Aberration of different Stars; and, ſince it does this without allowing any Thing at all for an annual Parallax of the fixed Stars, Mr. *Bradley* concludes that Parallax muſt be much ſmaller than hath been hitherto ſuppoſed by thoſe who have pretended to deduce it from their Obſervations: He is of Opinion he ſhould have diſcovered it, if it amounted

amounted to ſo much as a ſingle Second. That in ſhort is, he cannot certainly find, by all the Obſervations he has made, that the fixed Stars have any annual Parallax at all.

What Dr. *Long* has collected, in the nineteenth Chapter, of the ſeveral ingenious but conjectural Methods, that have been uſed for determining the Diſtance and Magnitude of the fixed Stars, is very curious, and apt to ſuggeſt noble Ideas to the Mind: But from thence alſo we ſee how much Incertitude ſtill remains, and is likely ever to remain in our Notions of theſe Things, with whatever Air of poſitiveneſs ſome Philoſophers may affect to Speak or Write of them.

The different Ways of meaſuring the apparent Diameters of the Sun and primary Planets, ſet down in the 20th Chapter, may be much better depended on; though even theſe fall ſhort of abſolute Exactneſs: This our judicious Author acknowledges. He has in this Chapter given us two Tables, one of the Sun's apparent Diameter at his greateſt, mean, and leaſt Diſtance, according to ſeveral Authors; the other, A Table of the apparent Diameters of the primary Planets, as they are ſtated by different Authors: Nothing exact, he ſays, can here be expected from the Ancients; among the Moderns, he has marked with an Aſteriſk ſuch as beſt may be depended on.

CHAPTER XXII. We have in this Chapter a curious Hiſtory of Changes that have been taken Notice of in the fixed Stars, of cloudy Stars, and the like.

There are ſeveral Stars now to be ſeen in the Heavens, which are not mentioned in the ancient Catalogues; and others are now not to be found, though the Places in which they formerly appeared have been ſet down by Aſtronomers who obſerved them:

them: There are alſo ſome Stars whoſe apparent Magnitude is periodically increaſed and diminiſhed.

The moſt ancient Obſervation of a new Star is that by *Hipparchus*, about 120 Years before Chriſt; which occaſioned his ſetting about a Catalogue of the Stars, as afore mentioned. The Appearance of five other new Stars is recorded in Hiſtory; the Relations of all which are ſo imperfect, that nothing can be built upon them.

The firſt new Star, whereof we have any good Account, is that which in the beginning of *November* 1572 appeared in Caſſiopea, making nearly a Rhombus with the three Stars α β γ of that Conſtellation, where it was ſeen 16 Months ſucceſſively, without any Change of Place among the fixt Stars. This Star had no Hair round it or Tail as Comets have, but ſhone with the ſame Luſtre as other fixt Stars do, ſurpaſſing *Sirius* or *Lyra* in Brightneſs and Magnitude; it appeared even bigger than *Jupiter*, which at that Time was near his Perigee, and by ſome was thought equal to *Venus* when ſhe is in her greateſt Luſtre. It ſhone forth at once in all its Brightneſs, and continued to do ſo throughout *November*, ſo as to be ſeen, by thoſe who had very good Eyes, even at noon Day; and in the Night it might be perceived through the Clouds, by which other Stars were hid. It did not continue long of the ſame apparent Magnitude, for in *December* it ſeemed to be but equal to *Jupiter*: In *January* 1573 it was leſs than that Planet, but a little bigger than Stars of the firſt Magnitude; to which it was equal in *February* and *March*: Thus gradually diminiſhing, in *April* and *May* it was but of the ſecond Magnitude; in *June*, *July* and *Auguſt* it was only equal to the biggeſt Stars in Caſſiopea, which are counted of the third; in *September*, *October* and *November* it was no bigger than a Star of the fourth Order; and in *December* it equalled

equalled the Star called *x* by *Bayer*, to which it was near; towards the end of the Year 1573, and in the Month *January* of the Year following, it was but little ſuperior to Stars of the fifth; in *February* it was no bigger than a Star of the ſixth Magnitude; and in *March* became quite inviſible. It was alſo ſubject to divers Changes in Brightneſs and Colour, as it diminiſhed in Bigneſs: For, when it appeared biggeſt, its Light was white and brilliant; from that Time it grew a little yellowiſh; and in the beginning of the Spring 1573 was ſomething of the Colour of *Mars*, being reddiſh like the Bull's Eye, and a little leſs bright than the right Shoulder of *Orion*; in *May* it was of a pale lividiſh white like *Saturn*; which Colour continued to the laſt, as did its Sparkling alſo; only growing more dim, as it was nearer to its Diſappearing. This Star was obſerved by ſeveral Aſtronomers, but eſpecially by *Tycho Brahe*, who found it to have no ſenſible Parallax. Some have thought this Star to be the ſame which appeared A.D. 945, and 1264; its Place in the Heavens, our Author ſays, ſeems to favour this Opinion.

Auguſt 13 1596, *David Fabricius* obſerved a Star in the neck of the Whale, in 25° 45′ of Aries, with a ſouth Latitude of 15° 54′; it diſappeared after the Month *October* of the ſame Year. *Phocyllides Holwarda* obſerving it in the Year 1637, thought that the firſt Time of its being taken Notice of; he ſaw it come into View again, after having diſappeared nine Months: It has been ſince found to be every Year pretty regular in its Period; except that from *October* 1672 to *December* 1676 *Hevelius* could not ſee any thing of it. *Bulialdus*, in a treatiſe Printed at *Paris* in 1667, having compared together the Obſervations which had been made of it, from the Year 1638 to 1666, determined the periodical Time between this

Star's

Star's appearing in its greateſt Brightneſs and returning to it again to be 333 Days: He alſo found that about 10 Days paſs between the Time when it is firſt ſeen of the 6th Magnitude and its diſappearing; that it continues in its greateſt Luſtre about 15 Days; that after its Appearance of the 6th Magnitude it increaſes in bigneſs much faſter till it comes to be of the 4th, than it does from that Time to its being of the 3d; and that, from its being of the 3d, its increaſe to the 2d Magnitude is by ſtill ſlower Degrees. He accounts for theſe Appearances, by ſuppoſing this Star to be a Globe, having the greateſt Part of its Surface dark, the reſt being luminous; and that having a Rotation round its Axis, it turns ſometimes its dark, ſometimes its luminous Part towards the Earth.

But our Author notes, a ſimple Rotation will not explain the Variations that appear in this Star: For, 1. It does not every Year arrive at the ſame apparent Magnitude; but ſome Years it ſurpaſſes Stars of the ſecond Order, and other Years does not equal thoſe of the third: 2. The Time of its Appearance is not always the ſame; but ſome Years it is viſible four Months, and in other Years no longer than three Months: 3. The Time between its firſt Appearance and its coming to its greateſt Brightneſs, is not always equal to the Time between its arriving at its greateſt Brightneſs and diſappearing; but ſometimes its apparent Magnitude increaſes faſter than it decreaſes, and ſometimes it decreaſes faſter than it increaſes: 4. According to *Hevelius*, it was not ſeen at all for four whole Years, from *October* 1672 to *December* 1676. *Caſſini* makes the mean Period of this Star 334 Days. He accounts for the Variations of it, by ſuppoſing a Change in the Axis of the Star's Rotation; but our Author judges it more probable, that the Surface

of this Star is ſubject to Change, being ſometimes covered over with more Spots than at other Times.

Three changeable Stars have been diſcovered in the Conſtellation of the Swan, of all which our Author has given us a very circumſtantial Hiſtory; as he has likewiſe of another which appeared in the latter end of *September* 1604, old Stile, near the Heel of the right Foot of Serpentarius.

Beſides theſe, ſeveral other Changes have been obſerved in the Stars. *Montanari* found two Stars of the 2d Magnitude in the Conſtellation of the Ship, mark'd β and γ by *Bayer*, to be wanting: He ſays, they were ſeen by himſelf and others in 1664; when they firſt diſappeared he does not know, only he is ſure that on the tenth of *April* 1668 there was not the leaſt glympſe of them to be ſeen; and yet the reſt about them, even of the 4th and 5th Magnitudes, remained unchanged. He ſays, he has obſerved above an hundred other Changes among the fixt Stars, though none of them ſo great as thoſe.

I forbear mentioning many others Inſtances of the like kind, which our Author has collected; nor ſhall I tranſcribe any Thing he has ſaid in this Chapter concerning *cloudy Stars*, of which he has four or five Paragraphs. He tells us, upon the whole, he has given as full an Account as he could of changeable and cloudy Stars, from ſeveral Writers; by comparing of all which together, he has corrected the Miſtakes that ſome of them had fallen into.

At the Cloſe of this Volume he has ſet down the Hypotheſes offered by *Maupertuis*, *Hevelius*, and *Fontinelle* for ſolving the Phænomena of the periodical Stars, which are really as ſurprizing as any that we perceive in the Heavens. *Maupertuis* ſuppoſes: 1. That many of the Stars, like the Sun, have a Rotation round their own Axes: 2. That

That this Rotation cauſes them to deviate from an exact globular Shape into that of an oblate Spheroid, or Globe flatted: 3. That there may be infinite Variety in the Degrees of this flatneſs, ſo that ſome may be quite thin and flat like a round Trencher: 4. That a Star of this ſhape may have a large Planet going round it, in a Plane different from that of the Star's equator: In this Caſe, the Planet would be twice in every Revolution round the Star in the Plane of the Star's equator continued; at which Times it would cauſe no Change in the Situation of that Plane; but at all other Times it would, by its Attraction, change more or leſs the Situation of the Plane of the Star's equator, and moſt of all at the two Seaſons when it is fartheſt out of the Plane continued: By this Change, he ſuppoſes that ſuch a flat Star as at ſome Times cannot be ſeen by us, when only its thin Edge is turned towards our Earth, may, at other Times, by turning a good deal of its flat ſide towards us, become viſible.

Hevelius is of Opinion, 1. That the Sun and Stars are ſurrounded with Atmoſpheres: 2. That, whirling round their Axes with great Rapidity, they throw off great Quantities of matter into thoſe Atmoſpheres, and thereby cauſe great Changes therein: 3. And that thus it may come to paſs, that a Star, which, when its Atmoſphere is clear, ſhines out with great Luſtre, may, at another Time, when it is full of Clouds and thick Vapours, appear greatly diminiſhed in Brightneſs and Magnitude, or even become quite inviſible.

Fontinelle gueſſes, the fixt Stars being ſo many Suns, it is very poſſible that, among the infinite Number of them, there may be ſome *Half-ſuns*; our Sun has often Spots upon its Surface, which, if they were permanent and more extenſive, would reduce him to an *Half-ſun*. — The Stars which appear and diſappear without any regular Periods,

may be Suns that are ſometimes covered with very large Spots, from which at other Times they are perfectly free: The Changes in the Spots upon the Sun give us room to think there may be great Variety of Caſes in this Affair.

But whatever be the Caſe of periodical Stars, which may have Planets inhabited by Creatures fitted for ſuch Viciſſitudes of Light and Darkneſs as are allotted to them; our Author does not think it probable that a Star, which for a whole Century does not caſt Light enough to be ſeen by us, ſhould be appointed to do the Office of a Sun, or have any planetary Worlds to be enlightned or cheriſhed by it. What other Ends it may be made for, it may be in vain, as he adds, for us to conjecture. In the Works of Creation, as well as in the Ways of Providence, the deſigns of infinite Wiſdom, and the Methods by which infinite Power brings about thoſe deſigns, are often to us unſearchable. To conclude,

As for ſuch Stars as, after having been for many Years inviſible, break out inſtantaneouſly into Brightneſs, like thoſe in Caſſiopea and Serpentarius, it has been thought, that as the Sun may have now and then a Comet fall into it, the ſame may alſo happen to any of the Stars which, like the Sun, have Planets and Comets revolving round them: And then a Star, which had for a long Time been ſo covered with Spots as not to be viſible to us, may, when a Comet falls into it, be made to blaze out ſuddenly, by the Acceſs of that new Fuel; and may for a while continue to ſhine with great Luſtre; till, by the Spots returning and covering its Surface, it appears gradually to diminiſh in Brightneſs and Magnitude, and at laſt becomes again quite inviſible.

ARTI-

ARTICLE XXIV.

A Diſſertation on the unknown GOD *of the* Athenians. *By the Abbé* Anſelme, *of the Academy of Inſcriptions and Belles Lettres.*

ALL Antiquity aſſures us that the Heathens not only adored a Multitude of Deities, whom they believed they knew, but that the *Athenians* as well as other Nations even worſhipped Gods unknown.

Herodotus ſpeaking of the *Pelaſgians*, the oldeſt Inhabitants of *Greece*, who were *Nomades*, or wandering Shepherds, ſays that they adored Divinities whoſe Names they knew not. Herodot. lib. ii. apud Girald. Syntag. 1.

The ſame Cuſtom prevailed amongſt the *Celtæ*, a People of ancient *Gaul*, from whence, as *Lucan* remarks, they paſſed into *Spain*, and were thence called *Celtiberians*.* If the Idea this Nation had of their God, was heighten'd by their Ignorance of him, the Worſhip they paid him was not leſs ridiculous. *Strabo* tells us that it conſiſted in Dancing all Night, to his Honour, before the Doors of their Cottages, about the Time of full Moon.† Strabo Geogr. lib. iii.

The ancient *Arabians*, who adored the Stars, and even idolized Trees and Serpents, had an Altar dedicated to the unknown God, to whom thy ſacrificed Camels. Giral. Synt. xvii.

The *Romans* had their tutelary Divinities, whoſe Names they purpoſely concealed, leſt their Enemies,

* Profugique e gente vetuſtâ
Gallorum Celtæ miſcentes Nomen Iberi. Lucan. Pharſ. lib. iv.

† This Cuſtom prevails to this Day in ſeveral of the *Indian* Nations of *North America*.

knowing them, ſhould by evocatory Sacrifices, oblige them to abandon thoſe they protected. Even the proper Name of their Cities was kept as a great Secret, and imparted to few. It was unlawful to utter it, leſt their Enemies might make uſe of it in theſe kind of Solemnities, which were believed ineffectual, if the true Name of the Place was not expreſſed. The proper and ſecret Name of the City of *Rome* was *Valentia:* And *Valerius Soranus* was ſeverely puniſhed for revealing it. It is to this *Macrobius* alludes in the following Paſſage: "The *Romans* deſired "that the Name of their tutelary God, as well as "the *Latin* name of their City, ſhould be kept a "Secret."

Auguſt. in div. quæſt. lib. ii.

Macrob. Saturn. lib. iii.

Varro diſtinguiſhes all the Gods honoured by the *Romans* into two Claſſes, which he calls certain and uncertain Deities. By the former he means ſuch whoſe Exiſtence was firmly believed, as the Heaven, the Earth, the Sun, the Moon. By the latter he intends thoſe to whom the *Romans* had eſtabliſhed no peculiar Worſhip; or whoſe Name was myſteriouſly conceal'd, or their Divinity not fully underſtood.

Varro de Reb. div. et human. lib. ii.

Ovid introduces *Jupiter* ſaying, it was proper to leave certain Gods below, as not yet qualified to inhabit the Skies.

Quos quoniam nondum cæli dignamur honore,
Quas dedimus certe terras habitare ſinamus.

Met. lib. i.

The God of the *Jews* was reckoned in *Varro*'s laſt Claſs, probably, becauſe the *Romans* had heard from that People, that his Name was ineffable. *Lucan* hints at this † They were not aware that, properly ſpeaking, *God* can have no Name. It is true indeed that

† Et dedita Sacris
Incerti *Judæa* Dei. Lucan. Pharſ. lib. ii.

we

we bring with us into the World an Idea of a ſupreme Being, that this Idea anſwers to a real Object, and that nothing hinders our expreſſing it by a Word. But if we conſider God as he really is, we ſhall find it impoſſible by any Name to expreſs ſuitably his Nature and infinite Perfections. God ſays to *Moſes*, I AM THAT I AM. Exod. iii. 14. The *Jehovah* of the *Hebrews*, called by the *Greeks* τετραγράμματον, ſignifies only, that there is one God alone who exiſts, or who was, is, and ſhall be for ever.

The Deities of the Heathens (ſays one of the Martyrs in *Euſebius)* have need of Names to diſtinguiſh them, and avoid Confuſion: but the true God, who is one, and can be confounded with no other, has no need of any Name, nor indeed can have any. *Minutius Fælix* ſpeaks in the ſame Manner —— Seek not a Name for God, God is his Name. We have need of Words for particular Objects, to prevent Confuſion. The Unity of God renders any particular Name needleſs.* Athal. iii. apud Euſeb. *Hiſt.* lib. iv. c. 3. Minut. Fæl. in Oct.

The Worſhip of the true God being obſcured ſoon after the firſt Ages, Idolatry, which ſucceeded, was only a Corruption of natural Religion, which remained ſo engraved on the Minds of Mankind, that, rather than want ſome Object of Adoration, they made Gods of the Creatures themſelves; and we are led naturally to believe that this Idea of a God, which ſeems univerſal to all Men, but which the Clouds of Paganiſm have obſcured, firſt gave Riſe to the *unknown Gods*, and to the Altars which have been erected to them in different Countries, with the Inſcriptions of *Diis incertis. Diis ambiguis. Diis ignotis.*

* Ne nomen Deo quæras. Deus nomen eſt illi. Vocabulis opus eſt cum per ſingulos propriis Appellationum inſignibus multitudo dirimenda eſt. Deo, qui ſolus eſt, totum Vocabulum proprium eſt. Minut. Fælix.

Tertullian * confirms this. "I find (ſays that "Father) that the Sanctity of Altars has been pro-"phaned ſo far as to dedicate them to unknown Gods. "This ſacrilegious Worſhip proceeds from the "Biaſs the *Greeks* have to Idolatry. I alſo find "Altars erected to uncertain Gods. And the *Ro-*"*man* Superſtition was the Source of this deplo-"rable Blindneſs." What ſhall we think of this Conduct of the *Greeks* and *Romans*, unleſs, that Nature in ſome meaſure inſtructed their Reaſon, which, being too unenlighten'd to pay the true God the Worſhip due to him, rendered him this imperfect Honour?

Be this as it will, we find that this Devotion, properly or improperly paid, has been natural to all Nations either through Fear or Love. *Apollonius Tyanæus*, who in travelling the World had collected the particular Superſtitions of different Countries, and diſcovered the greateſt Zeal for the Worſhip of Idols, was wont to ſay, that it was proper and decent to ſpeak well of the Gods, of whatever Sort they were; above all (adds he) at *Athens*, where many Altars were erected even to Gods unknown.

What firſt gave Occaſion to this in that celebrated City, was a Peſtilence that ravaged the Country. Vows and Prayers were offered to all the Gods, but to no Effect. At laſt the Oracle was conſulted, to know what Remedy ſhould be employed to ſtop the increaſing Miſchief? The Anſwer was that they ſhould purify the City and its Territories by Sacrifices, without mentioning what particular God was to be appeaſed in this manner. In this Doubt, they ſend to *Epimenides* of *Crete*, who was Cotemporary with *Solon*. He interpreted the Oracle, by adviſing the *Athenians* to let looſe white and black Sheep in the Fields, and, cauſing the Prieſts to

Diogenes Laert. in Epimenide lib. ii.

* Invenio plane ignotis Diis aras proſtitutas, ſed Attica Idololatria eſt. Item eſt incertis Diis; ſed Superſtitio Romana eſt. *Tertullian.* adv. *Marcion.* cap. ix.

follow

follow them, that they ſhould ſacrifice to the unknown Gods in the Place where they ſtopt. In Memory of this Expiation, ſince that Time, ſeveral Altars were to be ſeen in *Attica*, without any Inſcription.

But when St. *Paul* went to *Athens*, he found one inſcribed to the *unknown God*. We may obſerve how genteely this great Apoſtle, when ſpeaking in the *Areopagus*, repreſents to the People there aſſembled the Abſurdity of it "And *Paul* ſtanding in the "Midſt of the *Areopagus* ſaid, I perceive, ye "Men of *Athens*, that in all Things "you are too ſuperſtitious, for, as I "paſſed by and beheld your Devotions, I found an "Altar, with this Inſcription, *To the* UNKNOWN "GOD, *&c.* *Acts* xvii. 22. 23.

If we may believe *Theophylact* and *Oecumenius*, this Altar was erected on Account of the War which the *Perſians* declared againſt the *Athenians*. Theſe laſt, ſenſible of their Weakneſs, ſent to demand Succour of the *Lacedemonians*. Theſe Ambaſſadors were ſtopt on the Road by the God *Pan*, who complained, that, being ſo exact in adoring ſo many different Gods, they ſhould neglect him; and aſſured them, that, if they would pay him the Honours due to him, he would crown their Arms with Succeſs. The War ending fortunately, the *Athenians* in Gratitude built him a Temple; but fearing, at the ſame Time, that ſome other unknown God might reſent a like Neglect, they raiſed within the Incloſure of the ſame Temple an Altar to this unknown Divinity, whoever he might be.

Suppoſing this Relation fabulous, it is however certain that *Pan* was a Deity of conſiderable Note amongſt the Heathens, who adored him as the Author of Nature. It ſeems to me that this is confirmed by the celebrated Hiſtory of an Event that happened at the Death of our Saviour *Jeſus Chriſt*, as it is related by *Plutarch*, and copied by *Euſebius*; and which I

ſhall

ſhall inſert in this Place, as a Proof of the Idea the Heathens had of the God *Pan*. This Story *Cleombrotus* had from *Æmilion* the Rhetorician, who heard it from his Father *Epitherſus* the *Lacedemonian*, who was an Eye and Ear-Witneſs of all its Circumſtances.

Epitherſus relates that in a Voyage he made to *Italy* near the Iſle of *Paxus*, one of the *Echinades* near the Mouth of the Gulph of *Corinth*, a Voice was heard to call the Maſter of the Veſſel by his Name, *Thamus*; who, having anſwered, was by the ſame Voice directed that, when he ſhould arrive at *Pelodium*, which is the Sea Port of *Buthrotus* in *Epirus*, he ſhould give Notice *that the great* Pan *was dead*. All thoſe on Board the Ship were aſtoniſh'd; *Thamus* however, when he reach'd the Place appointed, obey'd his Inſtructions, and, on repeating the Words, a confuſed Cry of Voices was heard, as lamenting and bewailing the News. When the Veſſel arrived at *Rome*, the Affair was made publick, and *Tiberius*, who heard it from *Thamus* himſelf, ſeem'd perſuaded of the Truth of it.

I ſhall not now examine, whether, as is commonly believed, the God *Pan* here repreſents *Jeſus Chriſt* himſelf, (as if our bleſſed Saviour had Occaſion to borrow the Name of one of his Enemies;) or whether the Dæmon was obliged to confeſs the Victory obtain'd over him by the Croſs. I ſhall only remark from St. *Chryſoſtom*, with regard to the Apparition of *Pan* to the *Athenian* Envoys, that this People did not receive their Gods all at once, but ſucceſſively: *Pan* (continues this Father) was admitted in his Turn, and, imagining there might remain ſome other God yet unknown, they erected an Altar to him under that Title. †

Chryſoſt. Hom. 3 in Epiſt. ad Tit.

† Conjicientes ex hoc fieri poſſe, ut eſſet et alius Deus qui ab ipſis neſciretur, ut etiam illi ſe ipſos devoverent, eam aram inſtituerunt, quam inſcriberent ignoto Deo, prope modum id ſignificantes: et ſi quis ignotus ſit Deus. *Chryſoſt.* Hom. 3 in Ep. ad *Titum*.

St.

St. *Jerome* is of Opinion, that the Inſcription of this Altar was not, *To the unknown God*, but rather, *to the Gods of Aſia, Europe*, and *Africa*; that is *to the foreign and unknown Deities*. *Pauſanias* and *Philoſtratus* are of the ſame Sentiment, which has been alſo embraced by ſome modern Writers.

Philoſtr. in vitâ Apollon. l. v. Pharſ. Eliac. 1.

But tho' there were in *Athens* and its Territory Altars dedicated to ſeveral Gods, as *Pauſanias* and *Philoſtratus* juſtly obſerve, yet that is no Reaſon why there might not be one inſcribed to one unknown God; as the Words of the Apoſtle are expreſs, "I "found an Altar with this Inſcription, *to the un-* "*known God:*" And it is highly improbable he would have grounded his Diſcourſe, to the *Athenians*, on a Fact that was not evident. Beſides, had the Inſcription been, as theſe Writers alledge, the Apoſtle would rather have condemn'd the Plurality of Gods, than explain'd the Attributes of the true God. On this Account the Notion of St. *Jerome* is rejected by St. *Chryſoſtome* and the Fathers of the *Greek* Church. Nay we know that the *Athenians* had this unknown Divinity in ſuch high Eſteem, that it was by him they ſwore on the moſt important Occaſions. A Proof of this we have in a Dialogue of *Lucian* intitled *Philopatris*, where *Critias* ſwears by the unknown God of the *Athenians*: and *Triphon* exhorts others to the Adoration of this Deity; "For us (*ſays he*) let us adore the unknown "God of the *Athenians*, whom we have diſco- "vered, and, lifting our Hands to Heaven, let us "thank him for making us worthy of his power- "ful Protection." This demonſtrates that the Inſcription of this Altar was to one God, and that he was believed ſuperior to all others.

Let us now enquire who this *unknown God* was? The venerable *Bede*, *Denis* the *Carthuſian*, and other Commentators, have ſuppoſed that the *Athenians*,

ans, having learnt that the *Jews* adored a God ſo great, ſo powerful, and holy, that even his Name was ineffable, paid him this Honour, that their City might not want the Protection of any Deity.

Were this true, the *Athenians*, who well knew St. *Paul* to be a Jew of great Learning, ſince, before his Appearance in the *Areopagus*, he had preach'd in the Synagogues, and other publick Places of *Athens*, and diſputed with the *Epicurean* and *Stoic* Philoſophers; I ſay, in this Caſe, the *Athenians* would certainly have heard him with Attention, and profited by his Inſtructions, as no People on Earth were fonder of new Doctrines: Whereas on the contrary we ſee, that, after hearing what he delivered, he was regarded *as a viſionary Preacher of new Gods.* St. *Chryſoſtome* is of Opinion that he was not conducted to the *Areopagus* to be heard, but to be tryed and puniſhed, becauſe this was the Tribunal for capital Crimes. *

Acts xvii. v. 18.

Add to this, that the *Jews* by their Laws were forbid all Commerce and Alliance with foreign Nations, by whom they were equally hated and deſpiſed. They were look'd on as a ſuperſtitious Nation, whoſe Religion paſſed for abſurd and ridiculous. *Moſes* (ſays a *Roman* Hiſtorian) had given them Laws contrary to thoſe of all other People. § "Whatever was ſacred in "other Countries, was prophane amongſt the *Jews*; "whatever was ſacred amongſt the *Jews*, was pro"phane in other Countries." He adds that they were a Race odious to the Gods. † It is plain therefore that the *Athenians*, in erecting this Altar to the *unknown God*, had no Deſign to honour the

Tacit. Hiſt. lib. v. 3. 4.

* Ad Areopagum duxerunt *Paulum* non ut quippiam cognoſcerent, ſed ut punirent, et ſuppliciis afficerent: ibi enim capitalia exercebantur judicia. St. *Chryſoſt.*

§ Profana illic omnia quæ apud nos ſacra, rurſum conceſſa illis, quæ nobis inceſta. Tacit. Hiſt. lib. v.

† Genus Hominum inviſum Diis. Ibid.

God

God of the *Jews*, whom they were far from acknowledging as the true God.

What we may certainly affirm is, that the *Athenians* were, in all Times, the moſt ſuperſtitious People in the Heathen World. There were in *Athens* more Idols than in all the reſt of *Greece:* For, beſides the Multitude of falſe Gods they had in common with other Nations, they had their particular Divinities; and they carry'd their Superſtition ſo far as to deify *Shame*, *Impudence*, *Joy*, *Calumny*, and other Paſſions. They even adored *Mountains*, *Valleys*, *Rivers*, and *Fountains*. They had eſtabliſh'd a Worſhip for the Divinities of diſtant Countries, leſs out of Regard for them, than to prevent their hurting them; and, in ſhort, at *Athens* every Thing was adored but the true God. *Cicero* reproaches them on this Account; and, to uſe an Expreſſion of *Petronius*, their Deities were ſo numerous that it was eaſier there to find a God than a Man. *

Cic. de. Legib. lib. ii.

At the ſame Time we muſt grant that the Philoſophers, and the wiſeſt Heathens, paid no great Regard to this Multitude of Divinities, and ſome, as *Lucian* in particular, went ſo far, as openly to ridicule them. How frequently does *Juvenal* † rally the *Egyptians* for their Adoration of Leeks. "O Holy Nation," (ſays the Poet) "whoſe Gar-"dens ſupply you with Deities!" It was well known that even their *Dii magni* or Gods of the firſt Claſs were the Invention of their Poets, who took the Liberty to deify the Paſſions, that they might gratify them without Reſtraint, as authoriſed by the Examples of their Gods.

Homer was ſo far from deſcribing the Gods, as they were in his Time, as his Apologiſts aſſert, that *Herodotus* expreſsly accuſes him and *Heſiod*, as

* Ut facilius poſſis Deum quam Hominem invenire. *Petron.* in Sat.

† Porrum et Cæpe nefas violare et frangere morſu,
O ſanctas Gentes! quibus hæc naſcantur in hortis
Numina. *Juvenal.* Satyr. xv.

thoſe

thoſe who had introduced the Knowledge of theſe falſe Divinities into *Greece*, and maintains, that theſe Poets gave them both their Names and Attributes, and eſtabliſhed, according to their own Fancy, the Honours paid them: The contemptible Characters of theſe Deities authoriſes this Charge of the Hiſtorian. *

Pythagoras repreſents *Homer* as tormented in Hell, for having infected the Minds of Mankind by the Invention of fabulous Deities; for the ſame reaſon *Plato* baniſhed Poets from his Republic.

But we may ſee ſufficiently from the Writings of the ſame *Plato*, and thoſe of *Epictetus*, *Socrates*, *Cicero*, and others of the beſt ancient Authors, that, even from the unaſſiſted Light of Reaſon and the Works of Nature, theſe Sages acknowledged a ſupreme Being, whoſe Power firſt created, and whoſe Providence governed the World. When theſe eminent Men ſhew'd any Regard to a Plurality of Gods, it was only in Condeſcenſion to the popular Errors, which they wanted Courage to oppoſe, and from a peaceable Conformity to the eſtabliſhed Modes of Worſhip. *Seneca* expreſſes this clearly in the following Paſſage. * "We adore "(ſays he) all that ignoble Crowd of Divinities, "that Superſtition has idolized, in ſuch a Manner, "as to remember that this Devotion is rather cu- "ſtomary than real." The Study of Philoſophy (as St. *Auguſtine* well obſerves) had furniſhed *Seneca* with Lights, to think ſo freely; but as, in Quality of a *Senator*, he was obliged to conform to the eſtabliſhed Worſhip of *Rome*, he paid an exterior Reſpect to what he ſecretly condemned, and in

Plato de Legib. lib. x.

Euſebius de præp. Evang. lib. xiii. c. 8, 11.

* See *Heſiod*'s Theogony. *Quintilian* makes him the Author of Fables.

* Omnem iſtam ignobilem Deorum turbam quam longo Ævo ſuperſtitio congeſſit, ſic adorabimus, ut meminerimus cultum ejus magis ad Morem quam ad Rem pertinere. *Sen. ep.*

appearance

appearance honoured Divinities, whoſe Exiſtence he diſbelieved. *

Such was the ſhameful Prevarication, into which the moſt enlighten'd of the Heathens fell. They ſaw, they knew the Truth; and yet, either through Fear or Intereſt, injuriouſly held it captive. St. *Paul* juſtly reproaches them on this Account: *Becauſe that which may be known of God, is made manifeſt in them, for God has ſhew'd it to them: For the inviſible Things of him, from the Creation of the World, were clearly ſeen, being underſtood by the Things that are made, even his eternal Power and God-head*; they had not only abundant Lights from Nature and Reaſon, but God had moreover graciouſly informed their Underſtanding, or, as the Apoſtle expreſſes it above, had ſhewed himſelf to them. This therefore renders them wholly inexcuſable, that, after ſuch clear Illumination, they did not glorify God, but transferred to Idols the Honour due to him alone. *So that they were without Excuſe,* (as the Apoſtle continues) *becauſe, when they knew God, they glorified him not as God, but changed his Glory into an Image made like corruptible Man, and to Birds, to four-footed Beaſts, and creeping Things.* The Heathens, as St. *Auguſtine* obſerves, made great Diſcoveries by means of that Light wherewith God irradiated their Minds, but, at the ſame time, they fell into great Errors, occaſioned by the Miſts of Ignorance that ſurrounded them, and which were natural to Man in his fallen State. * God ſeems to have permitted this Inconſiſtency to humble the Pride of their vain Underſtandings, and

Romans i. v. 19, 20, 21.

Verſe 23.

* Sed iſte, quem Philoſophia quaſi liberum fecerat, tamen quia illuſtris Populi Romani ſenator erat, colebat quod reprehendebat, agebat quod arguebat, quod culpabat, adorabat. *Auguſt.* in Civ. Dei Lib. vii. Cap. 10.

* Quædam magna quantum divinitus adjuti ſunt, invenerunt; quantum humanitus impediti ſunt, erraverunt. *Auguſt.* de Civit. Dei Lib. ii. Cap. 7.

ſhew

ſhew them the Neceſſity of a Divine Revelation: Truths, of which they had a very imperfect Idea.

We ſee however from hence that St. *Paul* takes it for granted, the true God was not unknown to the Heathen Sages, notwithſtanding their Compliance with the prevailing Idolatry; we may therefore conclude that the *Athenians*, at this Time the moſt learned and polite People in the World, had this Knowledge, and that they were only led by Superſtition to adore ſo many fictitious Deities, becauſe they ſought in vain, by Reaſon, to diſcover and adore the true *God*.

But while Reaſon convinced them of the Exiſtence of ſuch a Being, they could form no Idea of him, and neither define nor name him. *Cicero*, on this Subject, relates that *Hiero*, King of *Syracuſe*, having aſked *Simonides* the Queſtion, *what was God?* this famous Lyric Poet, eſteemed at that Time one of the moſt learned Men in *Greece* or *Sicily*, deſired a Day to return his Anſwer: The Time expired, he begg'd a ſecond Day, and ſo on to the fourth, when he freely replied, "that the more attentively he "conſider'd the Subject, the more he found it in-"comprehenſible: That Nature and Religion "gave him ſo high an Idea of this ſupreme Power, "that it paſs'd his moſt exalted Ideas; but he was "firmly perſuaded at the ſame Time of the Exi-"ſtence of ſuch a Being."

480 Years before the Chriſtian Æra.

We may then ſuppoſe that the better Part of the *Athenians*, who, by cultivating Arts and Sciences, were arrived at a conſiderable Degree of Improvement in Learning, knew the Vanity of the Multitude of Deities they adored, and that the Worſhip paid them, was the Effect of vulgar Prejudice and Error: They were ſenſible, there was a ſuperior Power, of a ſpiritual Nature, who could neither be

repreſented

repreſented, nor deſcribed, nor named, like the Gods they adored; and perſuaded of this Truth, they erected to him the Altar, on Occaſion of which St. *Paul* tells them, "*Whom* "*therefore ye ignorantly worſhip, him I* "*declare unto you.*" Acts xviii. v. 23.

Thus, if while they imperfectly honoured the true God, they retained the Worſhip of Idols, it was becauſe they neither could nor durſt ſuppreſs the Forms ſo long eſtabliſhed. Even *Plato*, tho' well apprized of the Exiſtence of the true God, yet followed the Practice of Idolatry, which he aſſerts, it would be dangerous to attempt the Abolition of, for fear of riſquing the Peace of Society. *Socrates*, we find, was treated as an Atheiſt, and, by popular Faction, condemned to Death, for having ſaid that the Gods of *Athens* were not real Gods. This political Maxim of *Plato* and other *Greek* Philoſophers was adopted by the *Romans*, as we may gather from ſeveral Paſſages of *Cicero* and *Seneca*, who advance that, with reſpect to religious Worſhip, we muſt conform to the eſtabliſhed Modes of every Country, to preſerve the public Tranquillity. Cicero de Nat. Deor. lib. i.

To ſay the Truth, the greateſt Part of the Heathen Philoſophers lived in a falſe State of Tranquility, imagining that, while they openly adored a Multiplicity of Gods, they ſecretly worſhipped but one.

Amongſt the Epiſtles of St. *Auguſtine*, we find one of the Grammarians, *Maximus*, who, ſpeaking for himſelf, and the Heathens of his Time, lays it down as a fixed and undoubted Principle, that there was only one ſupreme Being, and treats all who think otherwiſe, as Fools and Madmen: "But (adds "he) as we are ignorant of his Name, we invoke him "by different Appellations, ſuitable to his Attri- "butes diſplay'd in the Works of Nature; and while "we thus honour him by Parts, we believe we adore

" him altogether." * St. *Auguſtine* refutes this, by telling him, that ſo abſurd an Opinion as that of ſuppoſing an infinitely perfect and ſpiritual Being, compoſed of Parts, does not merit a ſerious Anſwer. * This Paſſage of *Maximus* however ſerves to ſhew, that the *unknown God* of the Heathens, of whom they had ſuch confuſed Ideas, was the infinite Being acknowledged by the wiſer Part of them, who ſaw beyond the vulgar Mytholygy, and confirms me in my Opinion, that it was to this Being, the *Athenians* had erected their Altar.

This appears further from St. *Auguſtine*, who tells us that the *Athenians* had a confuſed and indiſtinct Notion of the true God, and that the Zeal of the Apoſtle tended to make them rightly worſhip, in the Church of Chriſt, him, whom they, who were out of the Pale of it, blindly and ignorantly honoured, without knowing him. *

Valtherus in Miſcell. 9. 90. Heinſius in Exercitat. 8. ad A. L.

Hellerius has left us a learned Diſſertation on this Subject, where, after proving at large that the true God was always known by the Light of Reaſon, and the Works of Nature, he concludes that it was to him this Altar was dedicated by the *Athenians*, adhering, as we have done, to the literal Senſe of thoſe Words of St. *Paul*, " *Whom therefore ye* " *ignorantly worſhip, him I declare unto you*." Shewing thereby that the true God was that Power whom they did not know, tho' Nature had taught them to worſhip him. I am ſatisfied that this is the true Explanation of this Inſcription, both becauſe the Authority of the ſacred Writings is unqueſtionably for it, and be-

*Hujus verò virtutes per mundanum opus diffuſas multis vocabulis invocamus, quoniam nomen ejus cuncti proprium ignoramus. Nam Deus omnibus Religionibus commune nomen eſt. Ita fit, ut, dum ejus membra carptim variis ſupplicationibus proſequimur, totum colere profectò videamur. St. *Auguſt.* Ep. 16, 17.

* Seriumne aliquid inter nos agimus, aut jocari libet ? Ibid.

* Quid eis præſtare cupiens, niſi ut eundem Deum, quem præter Eccleſiam ignoranter atque inutiliter colebant, in Eccleſia ſapienter et ſalubriter colerent ? *Auguſt.* contra *Crescent.* Lib. i, Cap. 29.

cauſe

cauſe the ingenious Turn the Apoſtle gives his Diſcourſe, was certainly founded on the Preſumption he had, that the learned Part of his Audience would be inſtructed to hear, "That the great God, *who had made the World, and all Things in it*; who was the *Author of Life, and of all Good*; *and had appointed a Day wherein he would judge the World in Righteouſneſs, was that very unknown God whom they ignorantly worſhipped.*" If in ſo numerous and learned an Aſſembly few were at that Time converted, we may however conſider that his Preaching convinced that illuſtrious Senator, whom he afterwards ordained Biſhop of *Athens*, and whoſe Life and Doctrines ſoon produced a happy Change throughout that celebrated Seat of Learning.

Acts xvii. v. 24, 26, 31.

ARTICLE XXV.

Diſcourſes concerning the Perfections of God; in which his Holineſs, Goodneſs, and other moral Attributes are explained and proved; the Foundations of true Religion, conſiſting in the Fear and Love of God, in Obedience to, and Truſt in him, are illuſtrated, and eſtabliſhed. By JOHN ABERNETHY, *M. A.* London: *Printed for* H. Whitridge, *at the* Royal Exchange. 1743. Octavo.

THAT to which the foregoing Title peculiarly belongs, is the ſecond Volume of the Diſcourſes of our excellent Author. An Account was formerly given by us of the firſt Volume, *concerning the* Being *and* natural Perfections *of* GOD, *in which the firſt Principle of* Religion, *the* Exiſtence

of the DEITY, *is proved, from the Frame of the* material World, *from the* animal *and* rational Life, *and from* human Intelligence *and* Morality; *and the* divine Attributes *of* Spirituality, Unity, Eternity, Immenſity, Omnipotence, Omniſcience, *and* infinite Wiſdom, *are explained*. The moral Attributes of God are what our Author undertakes to demonſtrate in this Volume; and this he has perform'd with the like Judgment, Force, and Eloquence, as he manifeſted in the former Treatiſes.

Our Author delivered his Sentiments on theſe exalted Topics in eleven Sermons. In the firſt, from *Rev.* xv. 4. he explains moral Agency, and in what Senſe it is to be attributed to God; and here he firſt ſhews, what clear and rational Evidence we have of God's *moral Agency* in general. 2*dly*, In what Senſe, and with what Limitations it is attributed to him. 3*dly*, To what uſeful Purpoſes it may be applied for the forming our Tempers, and governing our Practices.

Under the firſt Head he ſays, our Idea of moral Agency ariſes from an Attention to what paſſes in our own Minds. "We find in ourſelves conſcious "Perception with a Self-determining Power, and "Affections to certain Objects variouſly exerting "themſelves; all which, in ſomeDegree, and within "a limited Sphere, ſeem to be common to us with "other Animals. But there is in the Mind of "Man, which the brutal Nature appears to be in-"capable of, a Power of reflecting upon Affecti-"ons, its own, or thoſe of other Agents, together "with the Actions proceeding from them, which "are neceſſarily *approved* or *diſapproved*, judg'd to "be *good* or *evil*, and become Objects of a diſtinct "Affection, that, like others, is a Spring of Ac-"tion, influencing and directing our Practice." It is this that makes us moral Agents, and is the moſt important Part of our Conſtitution. It implies

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not only Intelligence, free Agency, and direct Affections to other Beings, but Affections arising from our reflecting upon Characters, Affections, and Actions morally distinguished; that is, appearing good or evil to our Minds, according to a certain invariable Standard placed in them.

"Now, if *the invisible Things of God from the* "*Creation of the World are clearly seen, being un-* "*derstood by the Things that are made*, if from the "Powers and Capacities of the Creatures we justly "infer his Existence and Perfections, particularly, "if the conscious Intelligence and active Powers "of some Beings formed by him, be a Proof of "his own Self-original Intelligence and Activity, "may we not, in like manner, from the moral "Powers, he has given to Mankind and other ra-"tional Creatures, infer his moral Agency? especi-"ally since this Character necessarily appears to "our Minds the most excellent and amiable, and, "of all others, the most important to a rational "Happiness."

Another way of apprehending this Subject is thus. It must be supposed, and it is no more than may be proved, that God is the designing Cause, the Preserver, and Governor of the World, and all Things in it; and that from the Relations and Correspondencies of Things which he has made, and upholds, we discern his particular Ends. "Now this implies a "*Character* or a *Will*, a permanent Principle deter-"mining him to act after one particular Manner "rather than another. But it is also demonstrable, "that Morality is an eminent Part of the human "Constitution; that is, the Mind of Man is so "framed, as, when it attains to the full Character of "its rational Powers, to be necessarily sensible of "moral Obligations, and to have all the Determi-"nation to satisfy them, which is consistent with "the Nature of such a Being, and the Nature of

" Virtue itſelf, *i. e.* with free Agency in an imper-
" fect State; that Morality is of the greateſt Mo-
" ment to the Perfection and Happineſs of every
" Individual, and the whole collective Body of
" Mankind; and therefore it muſt be attributed to
" our intelligent Creator as the true Cauſe of it,
" thereby intending thoſe very Ends, the Perfec-
" tion and Happineſs of our Nature, which it is
" naturally apt to ſerve." If it be ſo, it muſt then, our Author thinks, be allowed a juſt Conſequence, that it is the Will of God Man ſhould practiſe Virtue and abſtain from Vice, or that he approves the one and diſapproves the other. Is it poſſible to conceive, as he adds, " that God ſhould not
" be pleaſed with his intelligent Creatures acting
" agreeably to his own Deſigns, voluntarily fulfil-
" ling the Law of their Nature, and be diſpleaſed
" with their wilfully rebelling againſt it; ſince he
" has made them capable of diſcerning the end of
" his Conſtitution, and of acting freely either in
" purſuance of it, or in oppoſition to it? To ſup-
" poſe that he is indifferent to their Choice, and to
" their Courſe of Action, is abſurdly to ſuppoſe,
" that he is indifferent to the Intention of his own
" Works; indeed it is to ſuppoſe ſuch Inconſiſtency
" in his Counſels as cannot be reconciled to any No-
" tions of Wiſdom. Inanimate Things are alto-
" gether paſſive in fulfilling his Purpoſe; — all
" the Complacency he can have in them, is pro-
" perly no more than Self-Enjoyment, which
" ariſes from the Exerciſe and Manifeſtation of his
" own Attributes; but free Agents are the proper
" Objects of his Approbation or Diſapprobation,
" according as they do or do not actively comply
" with his Will made known to them, and with
" that eternal invariable Reaſon, by which his
" whole Adminiſtration is conducted.—— There-
" fore, as the Governor of ſuch Agents, his Cha-
" racter

" racter is moral, or in that Reſpect he is a moral " Agent."

Perhaps, our Author ſays, the cleareſt Notion we can form of God's moral Attributes, is by reſolving them into Benevolence, which, in Conjunction with infinite Wiſdom, will fully account for them all. No Principle is more amiable, none worthier of God, none more juſtly attributed to him, if we judge by the Appearances of Deſign in the Conſtitution and Government of the World. " Now if it be allowed that the Creator intended " the moſt *abſolute Good* in the whole of his " Works, and particularly in the Creation and " Government of rational Beings, it will evidently " follow that his Adminiſtration muſt be moral, or " it muſt be ſo conducted as, in the whole, to en- " courage Virtue, which tends to promote the moſt " univerſal Happineſs, and diſcountenance Vice, " which is naturally productive of Miſery."

Our Author conſiders, *Secondly*, in what Senſe and with what Limitations, moral Agency is attributed to God. It is evident, he ſays, that the Practice of Virtue, and the Obligation to it, differs according to the diverſity of Conditions wherein Agents are placed. That may be the indiſpenſible Duty of one, which is not required from, nor is indeed practicable by another more perfectly righteous and good Being, in Circumſtances intirely different. Gratitude, Reſignation to the Will of another, may be eminent Virtues in Men, and abſolutely neceſſary to a good moral Character; yet the Obligation of theſe, and the like, evidently ariſing from the Imperfection and Indigence of our State, to which there is nothing parallel in that of the ſupreme Being, they can therefore be no Part of his moral Rectitude.

To form as compleat a Notion of this Subject as the narrowneſs of our Capacities will allow, our

Author ſays, we may reflect on the Order and Connection of moral Qualities in the human Mind, and from thence take our riſe to the Conſideration of the ſame Attributes in other Agents endued with them, and even in the ſupreme Being himſelf. "We "feel in ourſelves various particular Affections of "the virtuous Kind, accompanied with Approbation, "ſuch as Gratitude, Compaſſion, natural Affection, "*&c.* which are Principles of ſelf-approved Ac- "tion, without a deſigned Reference to any other "higher End. But there is alſo another Principle, "namely, Benevolence, to which the virtuous In- "ſtincts abovementioned, and others like them, are "ſubordinated, and the Mind is juſtified to itſelf "in reſtraining and regulating their Exerciſe by its "Direction. It is obvious, to any conſiderate "Perſon, that Gratitude, natural Affection, and "Compaſſion, muſt give Place to the greateſt pub- "lic Good, or moſt general Happineſs, which is "the immediate Object of Benevolence. This, "therefore, is the principal, moſt comprehenſive, "and controuling moral Affection in our Minds.— "From this Idea of our own moral Frame, if our "Thoughts aſcend to ſuperior Agents, and even "to the abſolutely perfect Being, as we cannot "avoid apprehending an Order and Connection in "his moral Attributes, we ſhall find ourſelves led "to conceive of them in the ſame manner; —— "and ſhall naturally arrive at this Concluſion, (by "Steps which our Author has pointed out) *That the "greateſt Good, or moſt univerſal Happineſs, is the "ultimate End of the Deity, and pure Benevolence "the ultimate Determination of the divine Mind.*"

Hence, Mr. *Abernethy* ſays, we may infer, that *Benevolence*, the moſt excellent moral Affection, is to be attributed to God in the ſtricteſt and moſt proper Senſe. Other moral Principles, as Juſtice, Mercy, Faithfulneſs, which we cannot help think-

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ing inferior, becauſe they ultimately refer to Benevolence, and its immediate Object is their laſt End, theſe we alſo aſcribe to God, but in a more improper Senſe. They are diſtinct Principles in the human Mind, each accompanied with a Senſe of Excellence and Approbation; which is wiſely ordered by the Author of Nature, to excite us to good Works, which the more general calm virtuous Principle would not be ſufficient for without them; and becauſe we might not always be able to diſcern the Connection between them, and the ultimate end of virtuous Actions. "But theſe Reaſons do not "affect the ſupreme Being, and therefore there is "no need of ſuppoſing diſtinct moral Affections in "him, tho' we apprehend his moral Attributes in "that manner, being led to it by the Analogy it "bears to the Conſtitution of our own Nature." Nor does there appear any Inconvenience in this way of thinking, provided we never loſe Sight of the foregoing Diſtinction, retaining a juſt Notion of the abſolute Perfection of the Deity, infinitely above the Infirmity which accompanies particular Affections in us. "But however we diſtinguiſh, or do "not diſtinguiſh the Perfections comprehended in "the moral Rectitude of the Divine Nature, 'tis "plain it cannot be univerſally practiſed in the "ſame Way as by any other Being, or brought "down to the Standard of inferior Virtue. It is "the Rectitude of a Superior in every reſpect, and "conſiſts in what is more ſtrictly called Goodneſs "and Juſtice: Goodneſs diverſified in its Exerciſe, "according to the Circumſtances of the Object, "comprehending Grace, Mercy, Patience, and "Righteouſneſs, whereby he is univerſally inclined "to render to all his rational Creatures, according "to their Works."

But the principal Exerciſe of the Divine Rectitude in the Adminiſtration of Providence, relating

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to us, conſiſts in *God*'s approving *Good* and diſapproving *Evil*, in the Diſpoſitions and Works of his rational Creatures. " Tho' his Actions are not " to be brought down to the Standard of inferior " moral Agents, and their Virtues, ſuited to the " Imperfection of their State, are too low to be " practiſed by him in kind, and tho' his Admini- " ſtration is too deep for our narrow Underſtand- " ing to comprehend, (ſo that in ſome Caſes we " cannot take upon us to judge, how theſe Perfec- " tions are to exert themſelves, and what they re- " quire to be done) yet this is plain, and ſhould " deeply impreſs our Minds, that the Iniquities of " Man, and all other moral Agents, are always " an Abomination to him, and that *he beholds the* " *Righteous with a pleaſant Countenance.*" This is all along the Voice of Scripture, and more eſpecially of the New Teſtament, as our Author ſhews in the Sequel of what he has ſaid under this ſecond Head of his Diſcourſe, and which he conſiders as a Proof of the Divine Authority of thoſe ſacred Writings.

The Uſes of this Doctrine of God's moral Agency, which Mr. *Abernethy* has inſiſted on, are theſe: *Firſt*, the moral Rectitude of the Deity intitles him to our higheſt Eſteem and Veneration. *Secondly*, the firm Belief of this Principle, and a ſerious Attention to it, muſt have the greateſt Influence to promote Virtue among Men, and to reſtrain them from all kinds of moral Evil. *Laſtly*, the moral Perfection of the Deity is the great Pattern we ought to imitate: " Tho' it is not to be expected " we ſhould attain to the Perfection of Innocence in " this World, yet it is the Diſpoſition of thoſe who " *follow God as dear Children*, and keep his Purity " always in View as their Pattern, to contend for " it with ardent Deſire and conſtant Endeavour, " preſſing on unwearied in the Paths of Virtue,

" and

" and zealouſly oppoſing every kind of Evil which " they are tempted to. Again, the Imitation of " the Divine Rectitude will direct us to an Ab- " horrence of all vicious Characters, and to an " high Eſteem of all good Men. An univerſal " Benevolence to Mankind, even the worſt of " them, and a Diſpoſition to do them kind Offices, " ſuch as their Condition requires, or renders them " capable of, is a godlike Temper; but ſo is a " peculiar diſtinguiſhing Eſteem for good Men, " according to the Meaſure of their Goodneſs, " and an impartial Averſion to obſtinate, irre- " claimable Iniquity, wherever it appears."

The Citations I have made from this firſt Sermon, might ſerve to give us an Idea both of our Author's Stile and Reaſoning; as for the latter, we may probably try his Ability that Way again hereafter, upon ſome very curious Topics. It remains here only to ſpecify the Subjects of the ten following Sermons, of which this Volume is compoſed. The ſecond Diſcourſe then contains a Demonſtration of the Goodneſs of God, deduced from his Works. In the third, our Author has undertaken to anſwer the principal Objections that may be urged againſt the abſolute Goodneſs of the Deity. In the fourth, that Attribute of the divine Nature is explained, and practically improved. In the fifth, the Juſtice of God is evinced, and the Nature of it ſtated. In the ſixth and ſeventh is ſhewn the Incomprehenſibility of the Divine Perfections. In the eighth, Mr. *Abernethy* diſtinguiſhes Religion from Superſtition, and makes it appear that the former is the trueſt Wiſdom. In the ninth he ſhews, that Religion is perfectly conſiſtent with the true Intereſt of Mankind. The tenth explains and recommends the Love of God. The eleventh treats of Truſt in God, and Praying to him.

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ARTICLE XXVI.

MR. BENJAMIN MARTIN has publiſhed *A Courſe of Lectures in* Natural *and* Experimental Philoſophy, Geography, *and* Aſtronomy; *in which the* Properties, Affections, *and* Phænomena *of* Natural Bodies, *hitherto diſcovered, are exhibited and explained on the Principles of the* Newtonian Philoſophy, *under the following Heads, viz.* I. PHYSICS; *or the Doctrine of* Matter *and its eſſential* Properties. II. MECHANICS; *or the Doctrine of* Motion, *and all kinds of* Forces *and* Machines. III. HYDROSTATICS; *or the Nature and Laws of* Fluids *explained.* IV. HYDRAULICS; *or the Theory of the Motion of* Fluids, *and of all kinds of* Water-Engines. V. PNEUMATICS; *or the Nature and various Properties of the* Air *and* Atmoſphere. VI. PHONICS; *or the Theory of the* Winds, Sounds, Muſical-ſtrings, Notes, *&c.* VII. LIGHT *and* COLOURS *explained, according to the* Newtonian Theory. VIII. OPTICS; *or the Science of* Viſion, *and Theory of all kinds of* Optical Glaſſes *and* Inſtruments. IX. ASTRONOMY; *or the* ſolar Syſtem *of the* Planets *and* Comets, *and Uſe of the* Celeſtial Globe *explained.* X. GEOGRAPHY; *or the Theory of the* Earth, *and Uſe of the* Terreſtrial Globe *explained. The whole confirmed by* Experiments, *and illuſtrated with* Copper-Plates. *To which is added an* Appendix, *explaining all the* Characters, Phraſes, *and* difficult Words, *which occur in theſe* Lectures, *and other Treatiſes of this kind.* *

Mr. *Martin* printed theſe Lectures for the following Reaſons. *Firſt*, That they might be in the

* This Work is in Quarto, conſiſting of about 140 Pages, and eight large Copper-Plates. It is printed for Meſſ. *Newbery* and *Micklewright* at *Reading*, and ſold by *Jacob Robinſon*, at the *Golden-Lion* in *Ludgate-ſtreet*. Price 5 s. ſewed in Boards.

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Hands of his Subſcribers, to peruſe not only while they attend his Experiments, but after the Courſe is finiſhed, to retain and fix thoſe fleeting Ideas which they acquire from a tranſient View of ſuch a Multiplicity of Subjects and Operations. *Secondly*, Once more to ſerve the Public, by preſenting them with a Courſe of Lectures in natural and experimental Philoſophy compleat, ſo as to form a *general Idea or Plan of the Science*; containing an Account and Deſcription of many new Inſtruments and Experiments, and Explanations of ſeveral great Points, which are to be found in no other Courſe. *Thirdly*, To juſtify his own Character or Reputation as an Illuſtrator of Experimental Philoſophy, in Oppoſition to many ignorant and empirical Pretenders, who, as he ſays, are gone out obtruding themſelves, and a ſpurious Apparatus, on the good-natured and generous Part of Mankind. *Fourthly*, In Complaiſance to the *fair Sex*, to whom he has endeavoured to accommodate it: For why, as he obſerves, ſhould not the *Ladies* ſtudy and underſtand the Sciences of *Humanity*, of which *Philoſophy* holds the firſt Place?

Some Men, as Mr. *Martin* takes notice, are apt to vilify this noble Science by aſking, *of what Uſe is Philoſophy? What ſhall we get by it? What ſhall we be the better for it?* To ſuch mean Queriſts as theſe, whom he ſeverely cenſures, he replies, "That there is no *Art*, *Profeſſion*, or *Buſineſs* of "Life, wherein an intelligent Artiſt will not find "the greateſt Service and moſt beneficent Effects "redound from this Science."

Religion is founded wholly in *Philoſophy*, or a *true Knowledge of Nature*. It is from thence we have the firſt and trueſt Notions of the adorable Creator, and the moſt direct and cogent Arguments for his Exiſtence and Perfections.

No Man can rationally pretend to any Judgment in the Arts of *Chemiſtry*, *Pharmacy*, and *Medicine*, who does not underſtand the Power and Agency of the corpuſcular Parts of Matter, and the different Effects ariſing from the various Mixtures and Aſſociations of the original Particles of Matter in heterogeneous Bodies, the various *Hydroſtatic* and Hydraulic Laws of Fluids, the Parts and Structure of an animal Body, the animal Oeconomy, and the Influences of the *Sun* and *Moon* upon it: The Principles of all which are no where to be found, but in the ſeveral Branches of this Science.

Mr. *Martin* ſhews the Caſe to be the ſame with reſpect to *Optics*, *Navigation*, *Surveying*, *Dialling*, and *Gunnery*. Nor are *Aſtronomy* and *Geography* leſs beholden to Philoſophy than the foregoing Branches of Mathematics. Nay he brings in even *Poetry* itſelf as indebted to it: From this Science, he ſays, it borrows thoſe Ideas, Deſcriptions, and Subjects, which moſt of all ennoble it, and make it appear inſpired and ſublime.

All *Mechanics*, as he adds, and every mechanic Art or Trade, is founded in Philoſophy. Without ſome Degree of this, no one can account for the Effects of the *Hammer*, *Chiſſel*, or *Sciſſars*, (thoſe vulgar Machines) not to mention the *Lever*, the *Pulley*, the *Screw*, &c. And as to thoſe who learn the practical Part, without knowing any thing of the Reaſon of what they do, our Author will have them to be conſidered in the ſame View with the loquacious *Parrot*, and mimic *Chimpanzee*, rather than human or rational Artiſts: For it muſt, he thinks, be with the utmoſt Impropriety, that we call thoſe Creatures *rational*, *who underſtand not the Reaſon of Things in general*.—'Tis certainly every Man's natural Duty to learn and teach as much as he can of the ſurprizing Operations of Nature, and to admire the reſt, adoring their infinitely wiſe and

[illegible]ful Creator. THE